FUNAI

SERVICE MANUAL

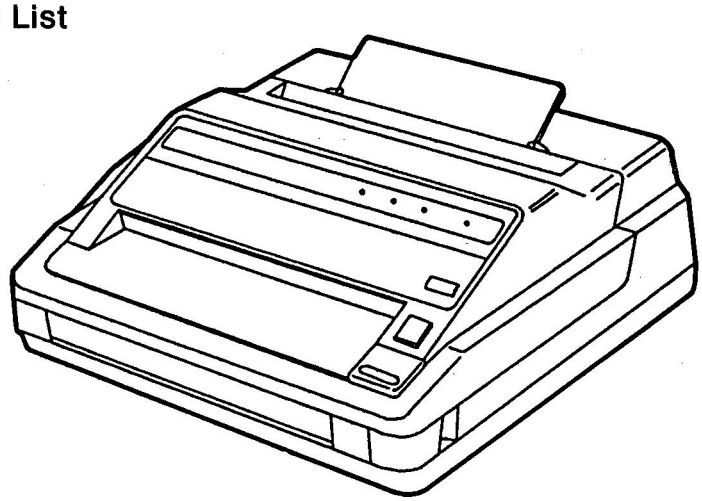
PERSONAL FACSIMILE

Disassembly Instructions
Pin Assignment
Terminal Description
Connector Description
Block Diagram
Connecting Diagram
Parts Layout
Electrical Parts List
Schematic Diagram
Exploded View
Mechanical Parts List

PFX5800

Area

V .....West Germany.
S .....Sweden.
E .....Finland.



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1. GENERAL SPECIFICATIONS

Model No.: PFX5800/PFX6800/PFX7800/FA-X11/FA-X21/FA-X10/FA-X20

Items	Descriptions
Line connection	PSTN (Public Switched Telephone Network)
Compatibility	CCITT G3/G2
Communication system	Half-duplex
Transmission speed	*25sec aprox. (G3, Normal mode 9600 BPS)
Modem	9600/7200/4800/2400BPS Automatic shiftdown
Coding	MH
Resolution	G3: (H) 8 pels/mm (V) Normal 3.85 lines/mm Fine 7.7 lines/mm
	G2: (H) 8 pels/mm (V) 3.85 lines/mm
Scanning Method	Contact image sensor
Printing Method	Thermal transfer
Document size (W × L)	216mm × 600mm max. 100mm × 150mm min.
Thermal paper roll (W × L)	216mm × 30m
Effective scan width	205mm
Effective print width	208mm
Talk request	Yes
Local copy	Yes
Auto Document Feeder	No
Auto Paper Cutter	No
Page number print	Yes
Contrast	Automatic
Manual/Auto receive	Yes
Power supply	AC 220−240V, 50Hz (EUROPE) AC 100−120V, 60Hz (USA, JAPAN)
Power Consumption	Stand by: 15 Watts Operating: 130 Watts max.
Size (W × D × H)	310mm × 278mm × 107mm
Weight	4.7Kg
Operating environment	Temperature +5~+35°C Humidity 35%~85% RH

*__Transmission speed:__ With a Funai standard document without time for protocol signal i.e., CCITT phase C time only.

Model No.: PFX6800/PFX7800/FA-X21/FA-X20

Item	Description
Halftone	Yes, 16 levels
LCD display	16 digits, 1 line
One touch dialing	10 locations (32 digits)
Abbreviated dialing	50 locations (16 digits)
Redial	Yes
Journal print	Yes (40 reports max.)
Transmit Terminal ID	Yes (20 digits)
Clock & calendar	Yes

ROM NUMBER

WEST GERMANY	SWEDEN	FINLAND
VOL2018Y24	**SOL2199512**	**EOL2199512**

NOTE : ROM SEAL REFER

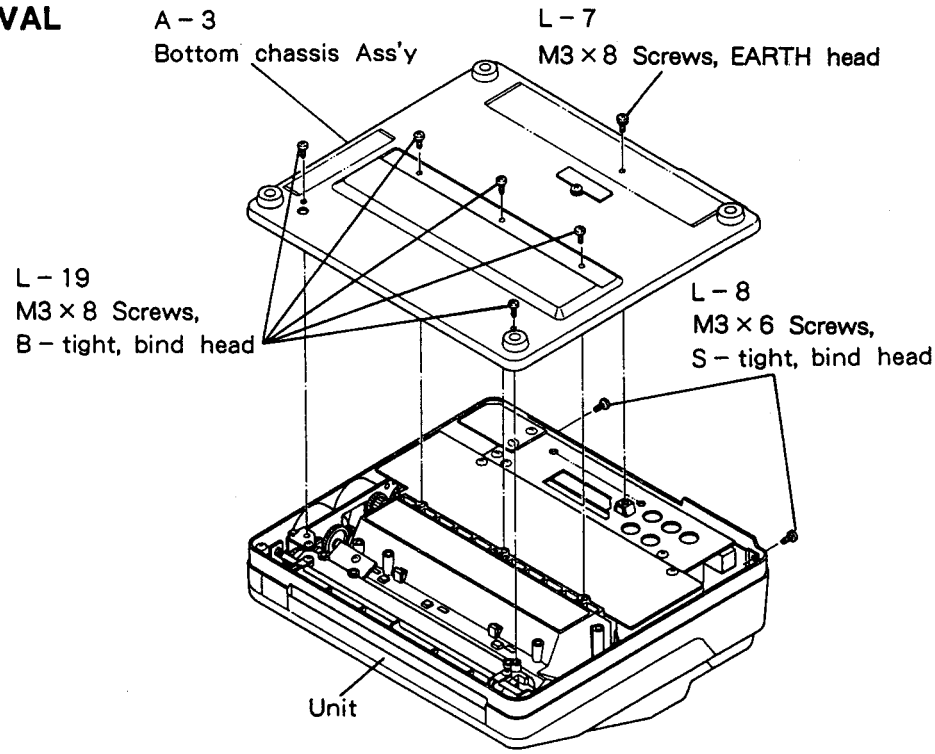
DISASSEMBLY INSTRUCTIONS

Precautionary instructions – Please read the following instructions carefully before proceeding.

1. Turn the power switch off and disconnect the power and telephone line cord.
2. Some electronic components are extremely susceptible to static damage.
   Use the unti – static discharge tools when working with the printed circuit boards.
3. Do not use excessive force to remove circuit boards or connectors.

1. BOTTOM CHASSIS REMOVAL

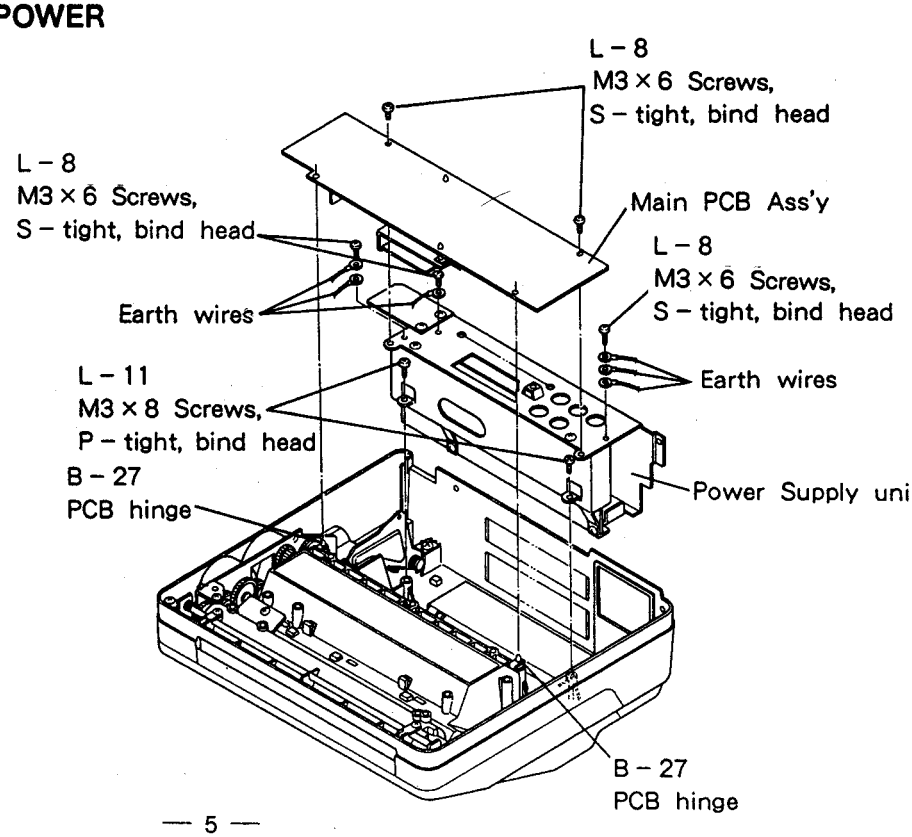
Remove screws L – 19, L – 7 and L – 8.



2. MAIN PCB ASS'Y AND POWER SUPPLY UNIT REMOVAL

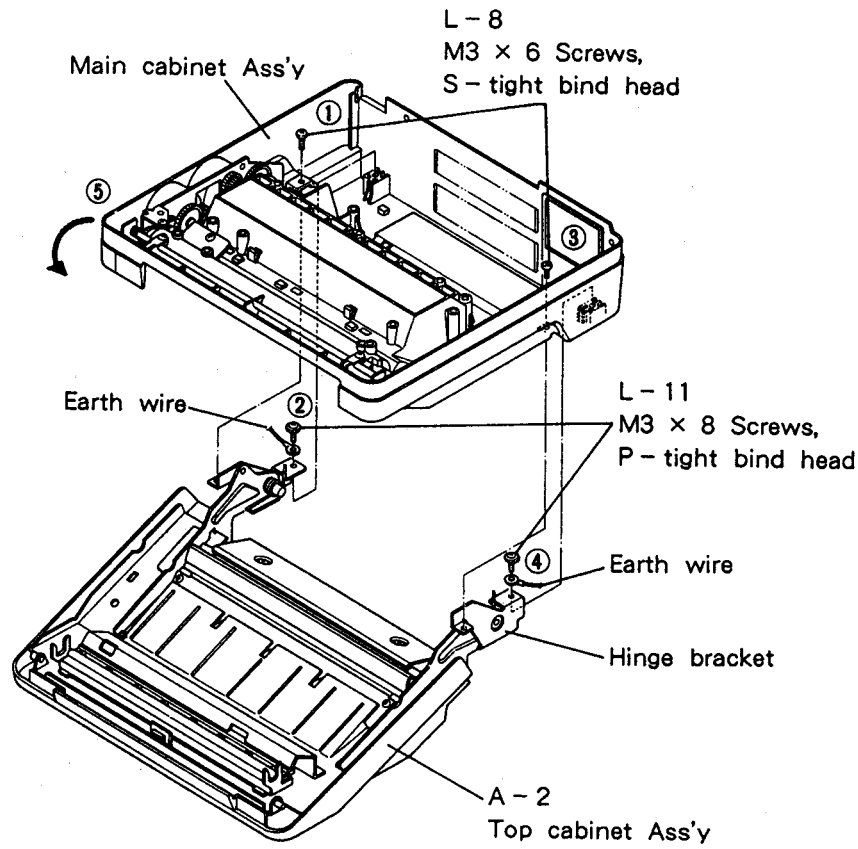
2 – 1. For removal of Main PCB, remove screws L – 8 and unfasten PCB hinges.

2 – 2. Screws must be removed in numeral order ①~⑦.



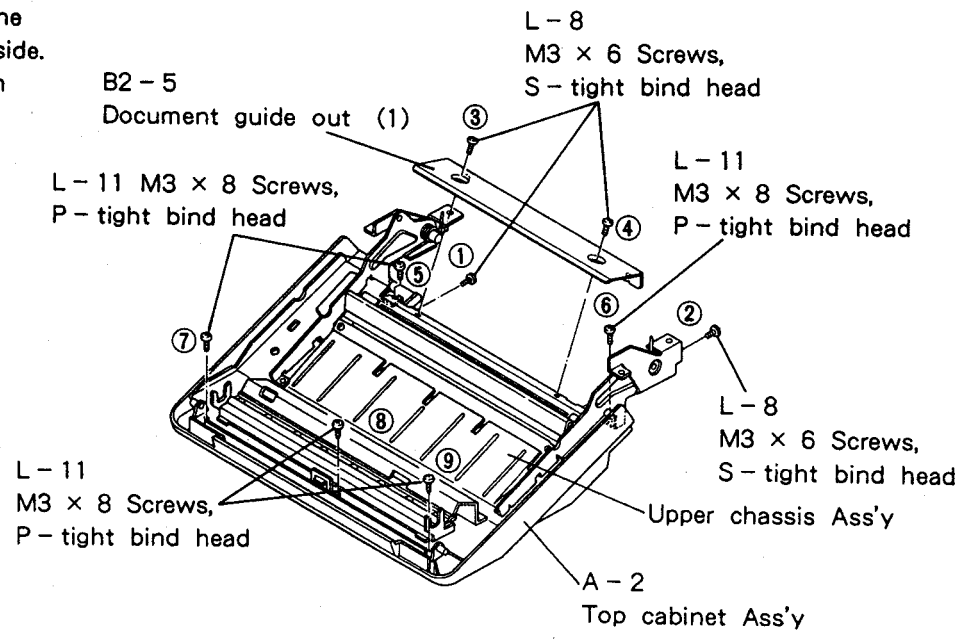
3. TOP CABINET ASS'Y REMOVAL

For removal of top cabinet Ass'y, remove screws ①~④. and pull the cover open lever as shown in ⑤.
Then pull up the hinge bracket portions of top cabinet.



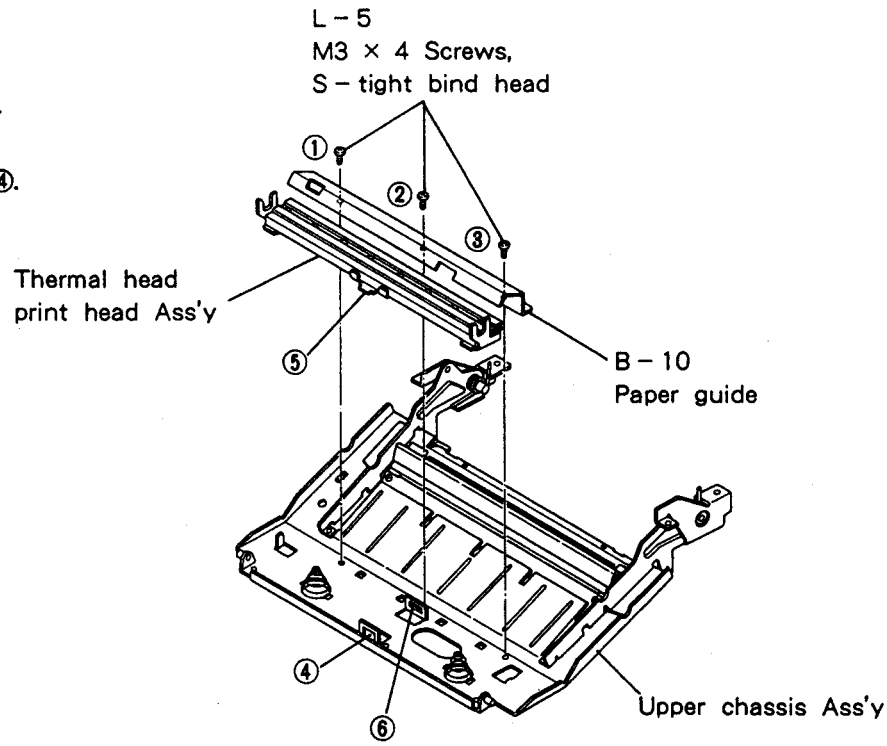
4. DOCUMENT GUIDE OUT (1), UPPER CHASSIS ASS'Y REMOVAL

For removal of upper chassis Ass'y, remove the document guide out (1) and slide the upper chassis toward rear side. Screws must be removed in numeral order①~⑨.



5. THERMAL PRINT HEAD ASS'Y REMOVAL

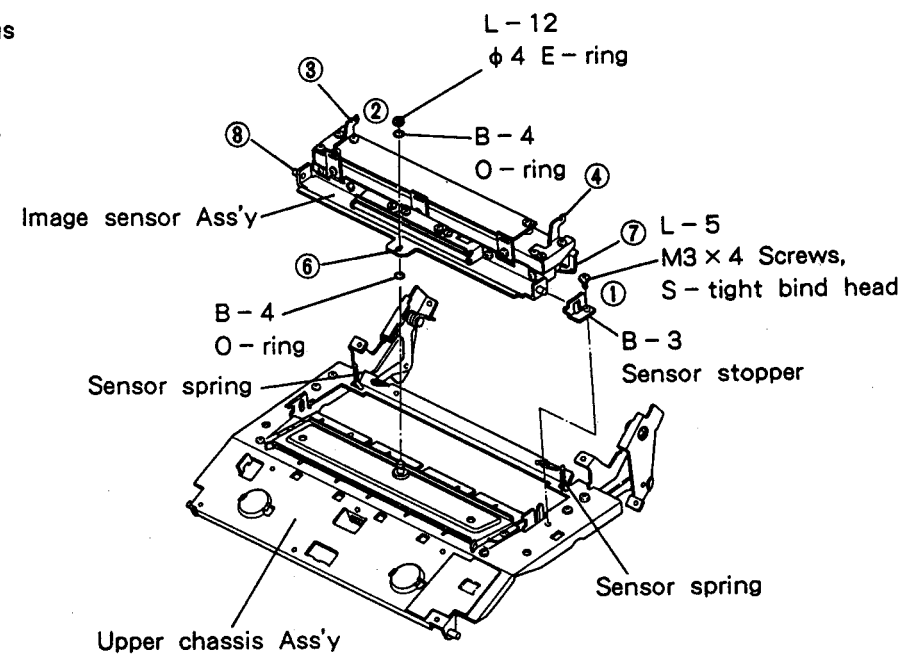
For removal of thermal print head Ass'y, remove screws ①~③ and remove the Paper guide. Push down the thermal print head Ass'y and then slide it toward rear side so that ⑤ portion will be dislocated from the upper chassis ④.



6. IMAGE SENSOR ASS'Y REMOVAL

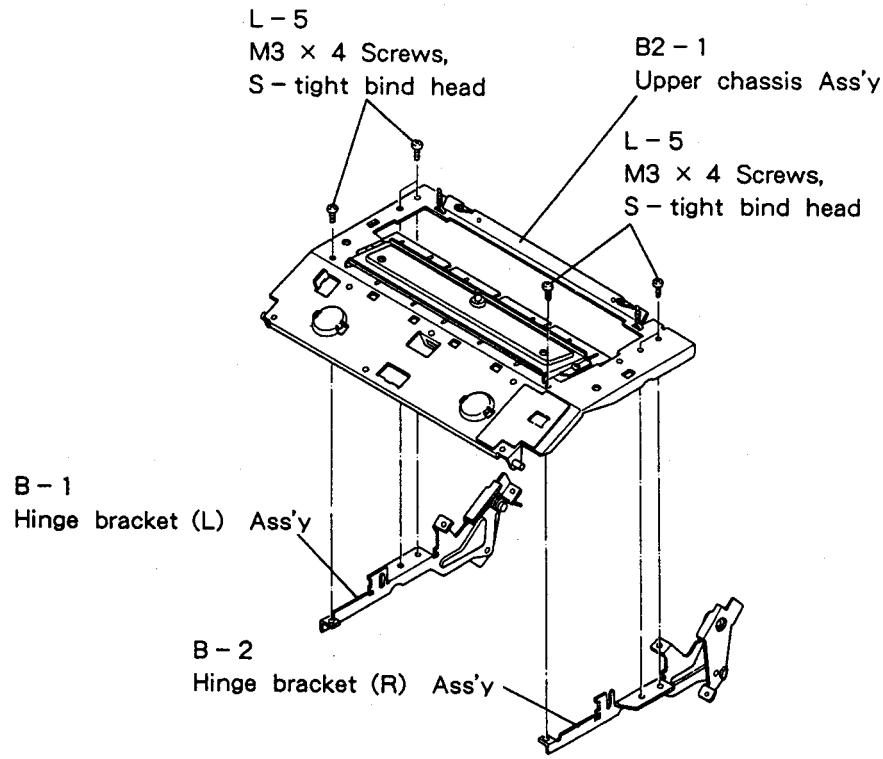
6 – 1. Remove E – ring and screw①.

6 – 2. For removal of image sensor Ass'y, dislocate sensor springs ③,④ then remove ⑥ portion, slide ⑦ portion toward front side and dislocate ⑧ portion.



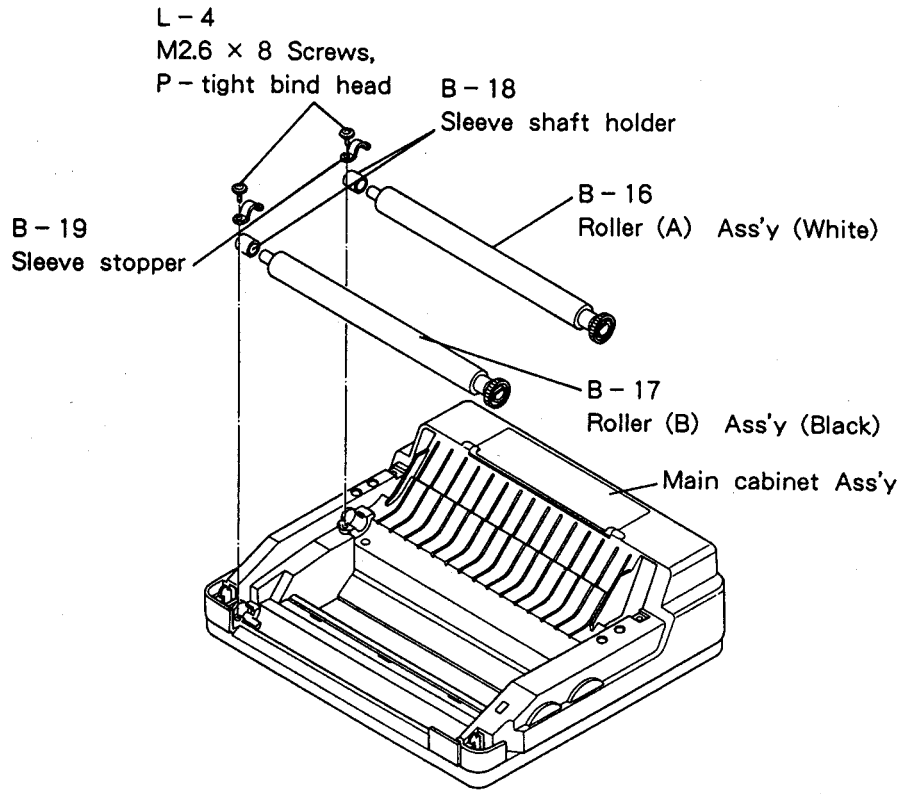
7. HINGE BRACKET ASS'Y REMOVAL

For removal of Hinge bracket Ass'y, remove screws L – 5 and slide the hinge bracket toward rear side as shown in arrows.



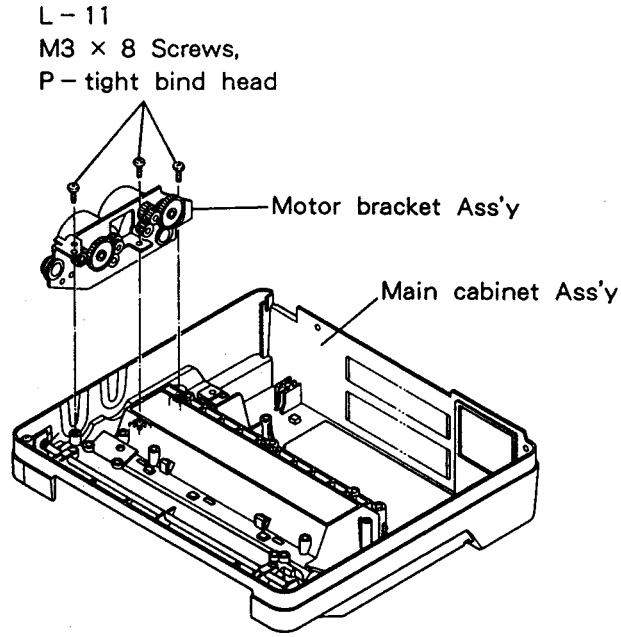
8. ROLLER ASS'Y REMOVAL

Remove screws L – 4, then dislocate roller Ass'y.



9. MOTOR BRACKET ASS'Y REMOVAL

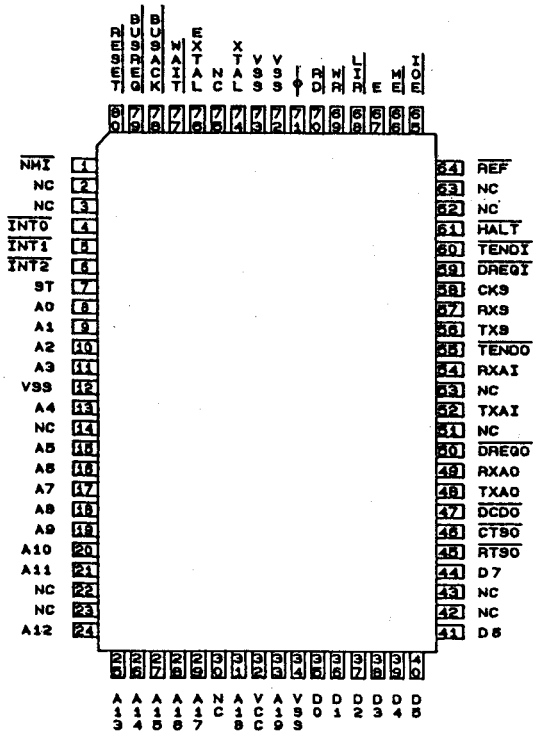
Remove screws L – 11 and dislocate the motor bracket Ass'y.



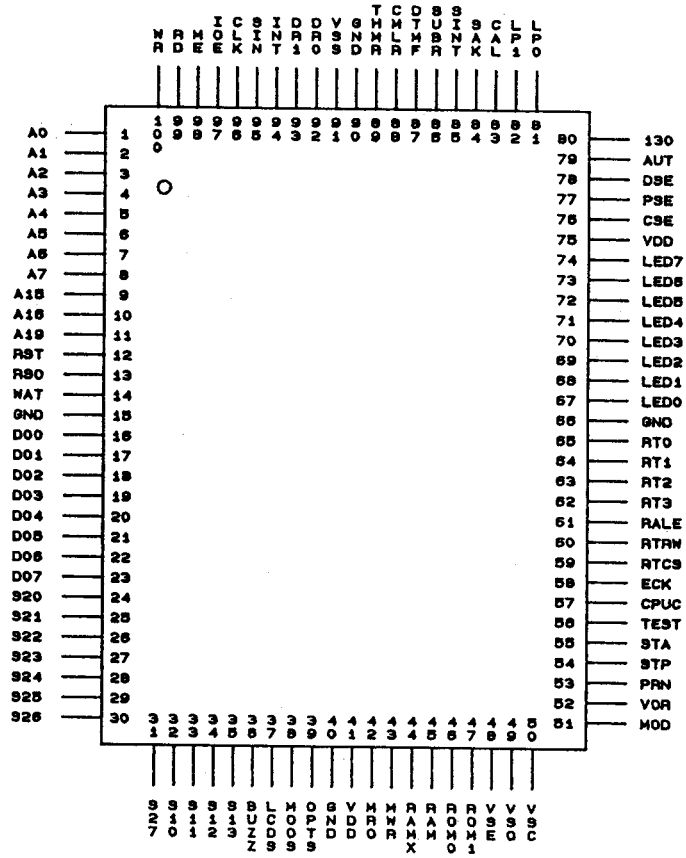
PIN ASSIGNMENT

1. IC

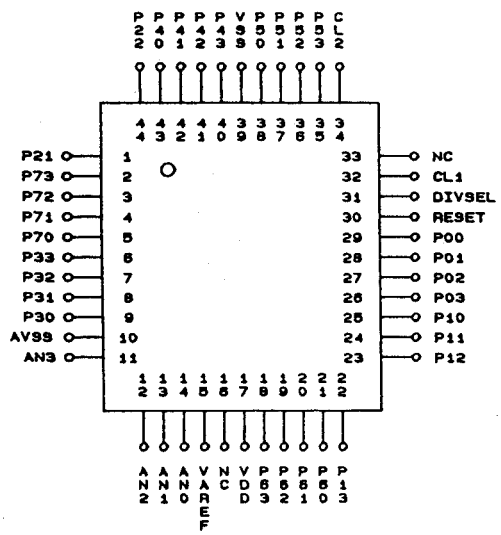
HD64180



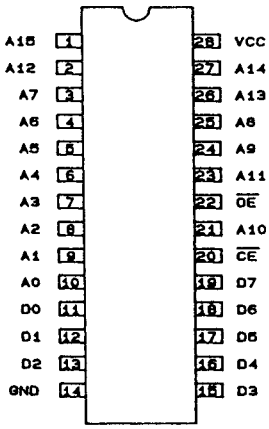
uPD65024GF – 021



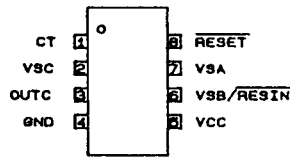
uPD7533GB



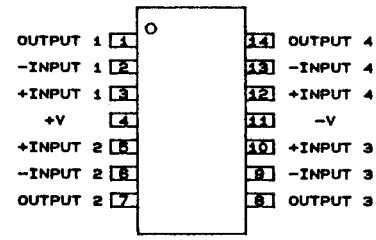
uPD27C512D



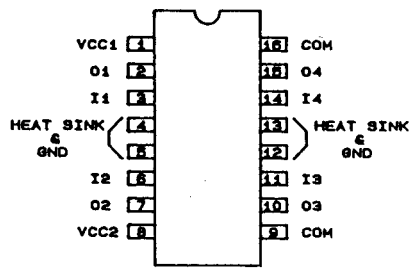
MB3771PF



NJM2060M



TD62308BP



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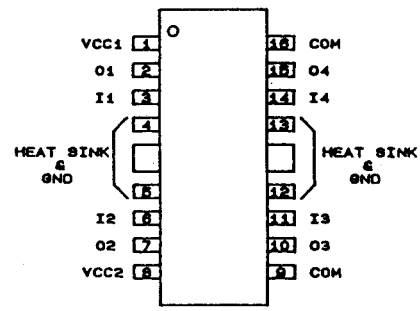

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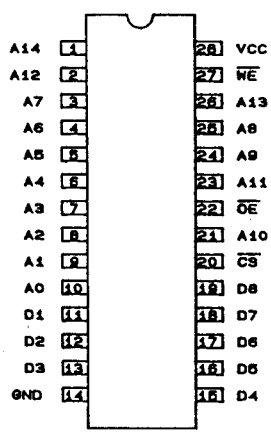
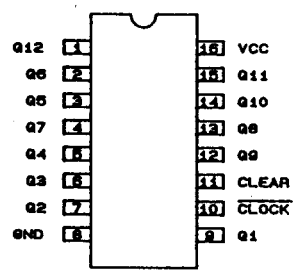
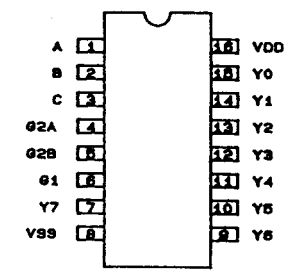


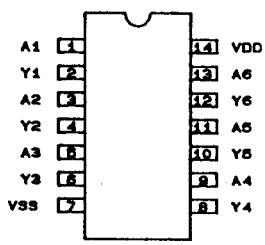
74HC4040AF



74HC138



74HC04



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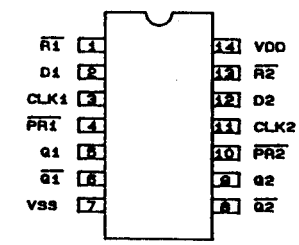
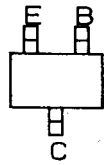
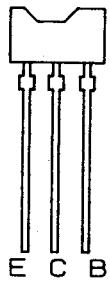


2. TRANSISTOR

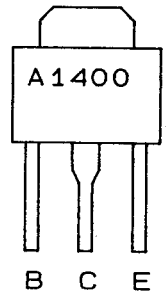
2SA1037K
2SC2412K



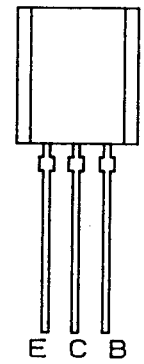
2SA1561



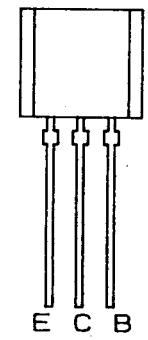
2SA1400



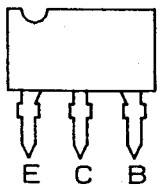
2SD1384



2SC2551

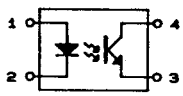


2SC2021
2SA937

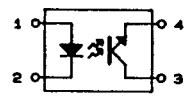


3. PHOTO COUPLER

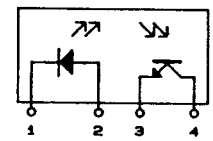
PS2403 – 3
TLP521 – 1



TLP806

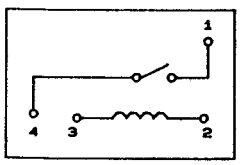


ON2153 – CA

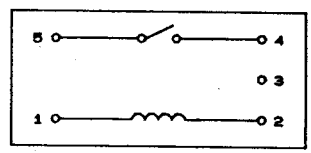


4. RELAY

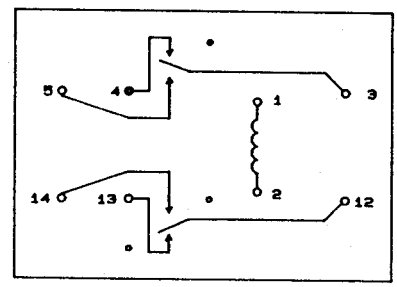
LZ12VM



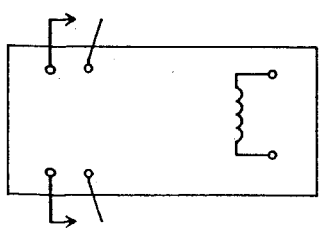
URA – N1



MR24 – N36

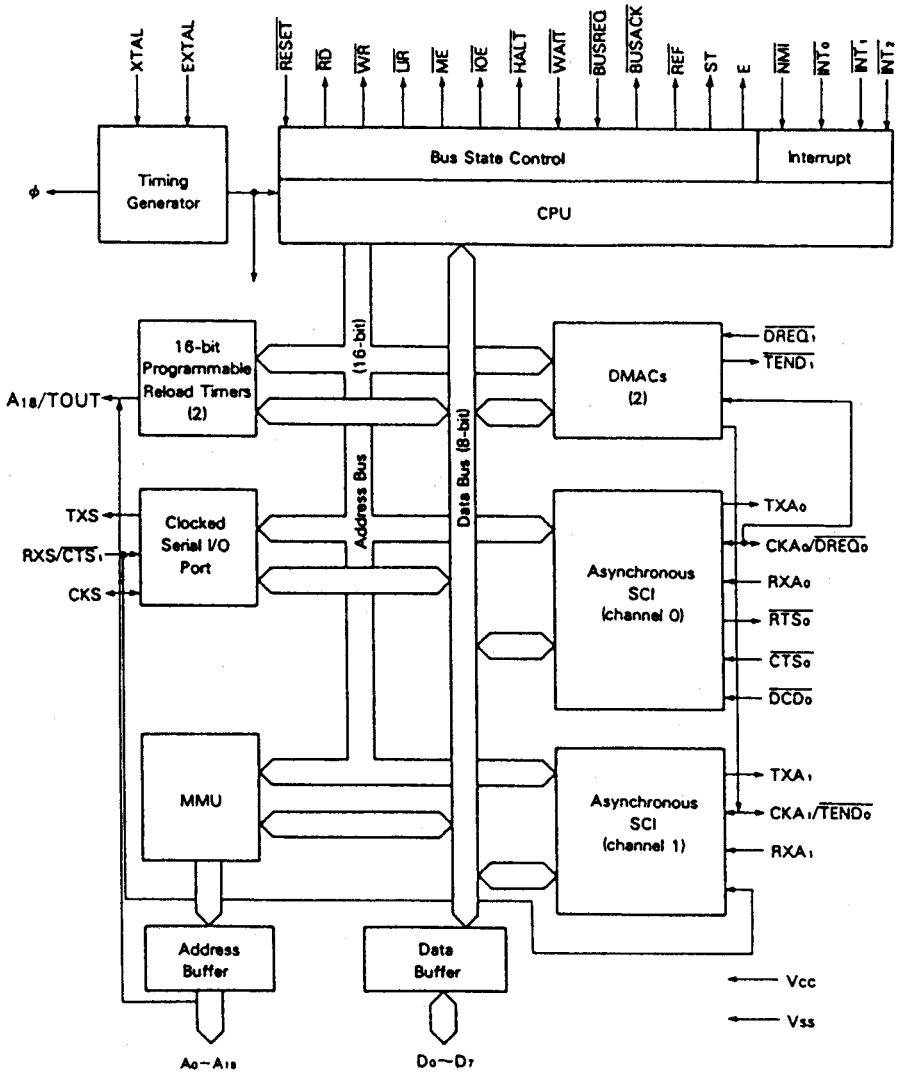


VB 12MBU – VD2



TERMINAL DESCRIPTION

1. MAIN MPU (IC1 : HD64180)



(A0–A19: HD64180R1; FP-80, CP-68)

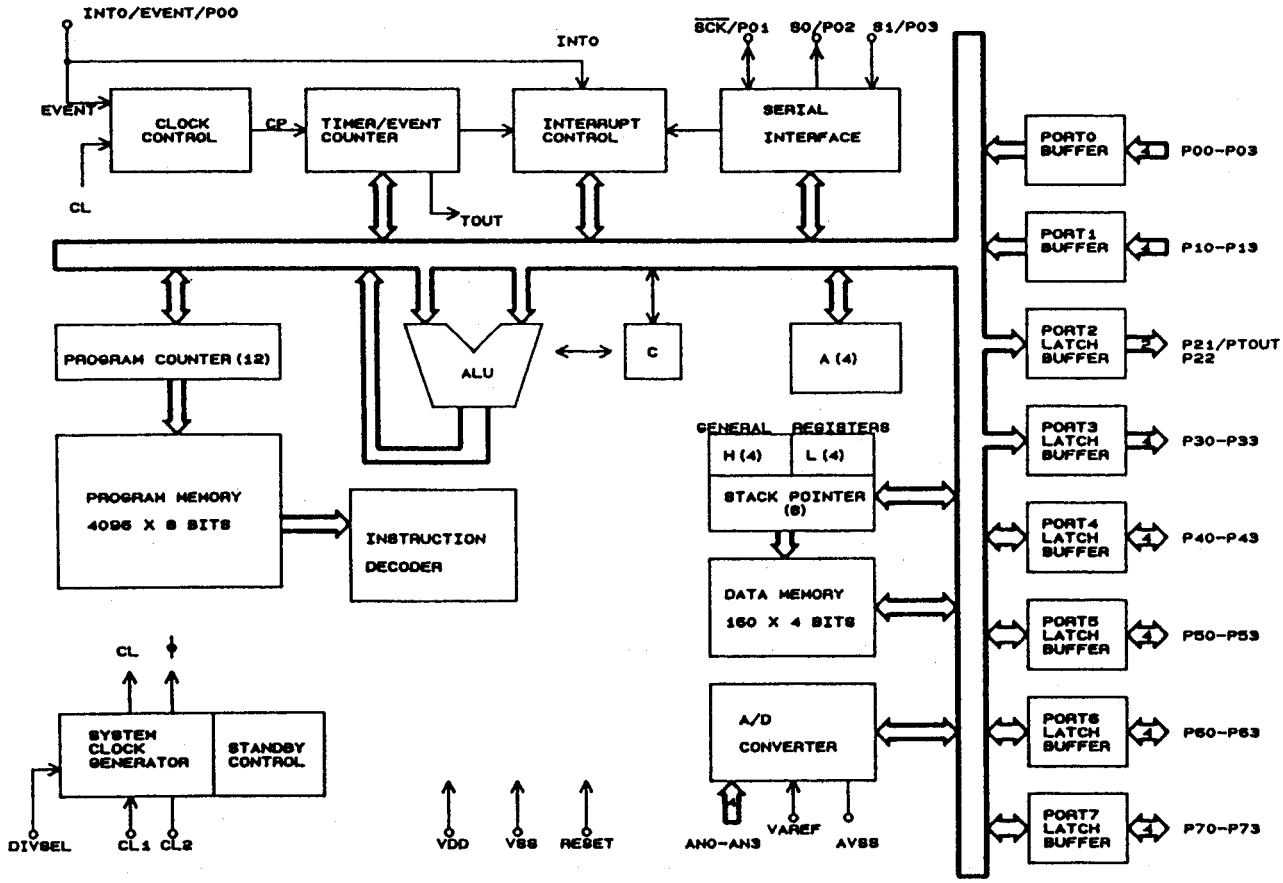
PIN.No.	I/O	Signal name	Description
1	I	$\overline{NMI}$	Non – maskable interrupt
2	—	NC	Unused
3	—	NC	
4	I	$\overline{INT0}$	Interrupt 0
5	I	$\overline{INT1}$	Interrupt 1
6	I	$\overline{INT2}$	Interrupt 2
7	—	ST	Unused
8	O	A0	Address Bus
9	O	A1	
10	O	A2	
11	O	A3	

PIN.No.	I/O	Signal name	Description
12	I	VSS	Ground
13	O	A4	Address Bus
14	—	NC	Unused
15	O	A5	Address Bus
16	O	A6	
17	O	A7	
18	O	A8	
19	O	A9	
20	O	A10	
21	O	A11	
22	—	NC	Unused

PIN.No.	I/O	Signal name	Description
23	—	NC	Unused
24	O	A12	Address Bus
25	O	A13	Address Bus
26	O	A14	
27	O	A15	
28	O	A16	
29	O	A17	
30	—	NC	Unused
31	—	A18	
32	I	VCC	Power supply
33	O	A19	Address Bus
34	I	VSS	Ground
35	I/O	D0	Data Bus
36	I/O	D1	
37	I/O	D2	
38	I/O	D3	
39	I/O	D4	
40	I/O	D5	
41	I/O	D6	
42	—	NC	Unused
43	—	NC	
44	I/O	D7	Data Bus
45	—	$\overline{RTS0}$	Unused
46	I	$\overline{CTS0}$	Clear to send for asynchronous SCI channel 0
47	I	$\overline{DCD0}$	Data carrier detect for asynchronous SCI channel 0
48	—	TXA0	Unused
49	I	RXA0	Receive data for asynchronous SCI channel 0
50	I	$\overline{DREQ0}$	DMA request for channel 0

PIN.No.	I/O	Signal name	Description
51	—	NC	Unused
52	—	TXA1	
53	—	NC	
54	I	RXA1	Receive data for asynchronous SCI channel 0
55	—	$\overline{TEND0}$	Unused
56	O	TXS	Transfer data for serial I/O port
57	I	RXS	Receive data for serial I/O port
58	I/O	CKS	Clock For Serial I/O port
59	I	$\overline{DREQT}$	DMA request for channel 1
60	—	$\overline{TENDT}$	Unused
61	—	$\overline{HALT}$	
62	—	NC	
63	—	NC	
64	—	$\overline{REF}$	
65	O	$\overline{IOE}$	I/O Enable
66	O	$\overline{ME}$	Memory enable
67	O	E	Enable
68	—	$\overline{LIR}$	Unused
69	O	$\overline{WR}$	Write
70	O	$\overline{RD}$	Read
71	O	O	System clock
72	I	VSS	Ground
73	I	VSS	
74	I	XTAL	Crystal resonator
75	—	NC	Unused
76	I	EXTAL	Crystal resonator
77	I	$\overline{WAIT}$	Wait
78	—	$\overline{BUSACK}$	Unused
79	I	$\overline{BUSREQ}$	Bus request
80	I	$\overline{RESET}$	Reset

2. ONE – CHIP MPU (IC2 : uPD7533GB723)



PIN.No.	Terminal designation	I/O	Description
1	P21	—	NC
2	P73	O	Printer side stepping motor excitation phase output
3	P72	O	
4	P71	O	
5	P70	O	
6	P33	O	Image – signal request
7	P32	O	Read – out tone – shading mode setting
8	P31	O	
9	P30	O	
10	AVSS	—	GND
11	AN3	—	
12	AN2	—	
13	AN1	I	Thermal head thermister
14	AN0	—	GND
15	VAREF	I	Referece input (5V) for internal A/D converter

PIN.No.	Terminal designation	I/O	Description
16	NC	—	NC
17	VDD	—	Power Supply
18	P63	O	Reader side stepping motor excitation phase output
19	P62	O	
20	P61	O	
21	P60	O	
22	P13	—	NC (GND)
23	P12	I	Input for setting the thermal head rank
24	P11	I	
25	P10	I	
26	P03	I	Command input
27	P02	O	Command output
28	P01	I	Command sync clock
29	P00	I	Interrupt input
30	RESET	I	Reset input
31	DIVSEL	—	Power Sipply

PIN.No.	Terminal designation	I/O	Description
32	CL1	I	Crystal resonator
33	NC	—	NC
34	CL2	I	Crystal resonator
35	P53	O	Decoder address signal for thermal head strobe
36	P52	O	
37	P51	O	
38	P50	O	

PIN.No.	Terminal designation	I/O	Description
39	VSS	—	GND
40	P43	O	Gate signal for thermal head strobe
41	P42	O	Affirmative response to command
42	P41	O	Distortion – correction start signal
43	P40	O	Page section
44	P22	O	Negative response to command

3. GATE – ARRAY (IC9 : uPD65024GF)

PIN.No.	I/O	Signal name	Description
1	I	A0	Address bus
2	I	A1	
3	I	A2	
4	I	A3	
5	I	A4	
6	I	A5	
7	I	A6	
8	I	A7	
9	I	A15	
10	I	A16	
11	I	A19	
12	I	$\overline{RST}$	Power – ON reset input
13	O	$\overline{RSO}$	Reset output
14	O	$\overline{WAT}$	MPU – wait output
15	—	GND	Ground
16	I/O	D00	Data bus
17	I/O	D01	
18	I/O	D02	

PIN.No.	I/O	Signal name	Description
19	I/O	D03	Data bus
20	I/O	D04	
21	I/O	D05	
22	I/O	D06	
23	I/O	D07	
24	I	$\overline{S20}$	Transmission level attenuator dip switch input
25	I	$\overline{S21}$	
26	I	$\overline{S22}$	
27	I	$\overline{S23}$	
28	I	$\overline{S24}$	
29	I	$\overline{S25}$	
30	—	$\overline{S26}$	Unused : held at + 5V
31	I	$\overline{S27}$	Transmission level attenuator dip switch input
32	I	$\overline{S10}$	Mode – set dip switch input
33	I	$\overline{S11}$	
34	I	$\overline{S12}$	
35	I	$\overline{S13}$	

PIN.No.	I/O	Signal name	Description
36	O	$\overline{BUZZ}$	Buzzer signal output
37	O	$\overline{LCDS}$	LCD signal output
38	O	$\overline{MODS}$	Modem select signal
39	O	$\overline{OPTS}$	Chip select baud rate device
40	—	GND	Ground
41	—	VDD	power supply
42	O	$\overline{MRD}$	Memory read signal (ROM, RAM)
43	O	$\overline{MWR}$	Memory write signal (RAM)
44	—	$\overline{RAMX}$	Unused
45	O	$\overline{RAM}$	RAM chip enable signal
46	—	$\overline{ROMO}$	Unused
47	—	$\overline{ROMT}$	Unused
48	I	$\overline{VSD}$	Image sensor enable input
49	I	$\overline{VSE}$	Image sensor data input
50	I	$\overline{VSC}$	Image sensor clock input
51	I	$\overline{MOD}$	Mode key input
52	I	$\overline{VOR}$	Talk key input
53	—	$\overline{PRN}$	Unused
54	—	$\overline{STP}$	Unused
55	I	$\overline{STA}$	Start/stop key input
56	I	TEST	Test terminal (usually used at LOW level)
57	I	CPUC	Clock input from MPU
58	I	ECK	Enable clock input from MPU
59	I	RTCS	8250 (clock IC) control signal
60	I/O	RTRW	Read/write control signal
61	I	RALE	Address latch enable
62	I	RT3	Address bus
63	I	RT2	
64	I	RT1	
65	I	RT0	
66	—	GND	Ground
67	O	$\overline{LED0}$	LED output
68	O	$\overline{LEDT}$	LED output
69	O	$\overline{LED2}$	LED output
70	O	$\overline{LED3}$	LED output

PIN.No.	I/O	Signal name	Description
71	O	$\overline{LED4}$	LED output
72	O	$\overline{LED5}$	LED output
73	—	$\overline{LED6}$	Unused
74	—	$\overline{LED7}$	
75	—	VDD	Power supply
76	I	$\overline{CSE}$	Cover sensor input
77	I	$\overline{PSE}$	Paper – end sensor input
78	I	$\overline{DSE}$	Document sensor input
79	I	$\overline{AUT}$	Negative response input from one – chip MPU
80	I	130	Power – supply thermal switch input
81	I	LP0	Loop current detection signal input
82	—	LP1	Unused
83	I	CAL	Ringer detection signal input
84	I	SBAK	Affirmative response input from one – chip MPU
85	O	SINT	Interrupt signal output to one – chip MPU
86	O	SUBR	Reset output to one – chip MPU
87	—	DTMF	Unused
88	O	$\overline{CMLR}$	RL2 relay switching signal output
89	O	$\overline{THMR}$	Relay switching output for thermal head current
90	—	GND	Ground
91	—	VDD	Power supply
92	O	DR0	DMA request signal output to MPU
93	O	DR1	DMA request signal output to MPU
94	O	$\overline{INT}$	Interrupt request signal output to MPU
95	O	SIN	Serial data output to thermal head
96	O	CLK	Clock output to thermal head
97	I	$\overline{IOE}$	I/O enable signal input from MPU
98	I	$\overline{ME}$	Memory enable signal input from MPU
99	I	$\overline{RD}$	Memory read signal input from MPU
100	I	$\overline{WR}$	Memory write signal input from MPU

CONNECTOR DESCRIPTION

Thermal head connector table

(Signal side)

No.	Signal designation	No.	Signal designation
1	TM	10	$\overline{STR1}$
2	TM (+5V)	11	DI
3	$\overline{STR8}$	12	CP
4	$\overline{STR7}$	13	$\overline{LA}$
5	$\overline{STR6}$	14	BEO
6	$\overline{STR5}$	15	NC
7	$\overline{STR4}$		
8	$\overline{STR3}$		
9	$\overline{STR2}$		

(Power supply side)

No.	Signal designation	No.	Signal designation
1	VDD (+5V)	8	GND
2	GND	9	COM (+24V)
3	GND	10	COM (+24V)
4	GND	11	COM (+24V)
5	GND	12	COM (+24V)
6	GND	13	COM (+24V)
7	GND	14	COM (+24V)

Image sensor connector table

(Signal side)

Terminal no.	Signal abbr.	Signal designation	I/O	Description
1	VIR	Image signal request	I	Pulse width ≧ 24.5 × VSCK (L : valid)
2	PGEN	Page section	I	L : transmission ; H : transmission stop
3	MDS1	Tone – shading mode 1	I	Appended table 2
4	MDS2	Tone – shading mode 2	I	Appended table 2
5	MDS3	Tone – shading mode 3	I	Appended table 2
6	VSDA	Image signal	O	L : black ; H : White
7	VSCK	Image signal clock	O	375kHz
8	VSEN	Image signal valid section	O	L : valid
9	SHST	Distortion – correction start signal	I	≧ 2 × VSCK (each page) ; L : Valid
10	CK8V	System clock	I	3MHz
11	NC		—	
12	– VSCK	Image signal clock	O	375kHz

(Power – supply side)

Terminal no.	Signal abbr.	Signal designation	Description
1	+12V	+12V (DC)	To +12V power supply
2	–12V	–12V (DC)	To –12V power supply
3	+5V	+5V (DC)	To +5V power supply
4	AG	Analog ground	One – point ground (power supply)
5	DG	Digital ground	
6	LEDP	LED (+12V)	To +12V power supply
7	LEDG	LED	Ground (power supply)

Power – supply unit connector table

Pin no.	Terminal designation
1	TH
2	+5V
3	DGND
4	DGND
5	+12V

Pin no.	Terminal designation
6	AGND
7	–12V
8	+24V
9	+24V
10	+24V

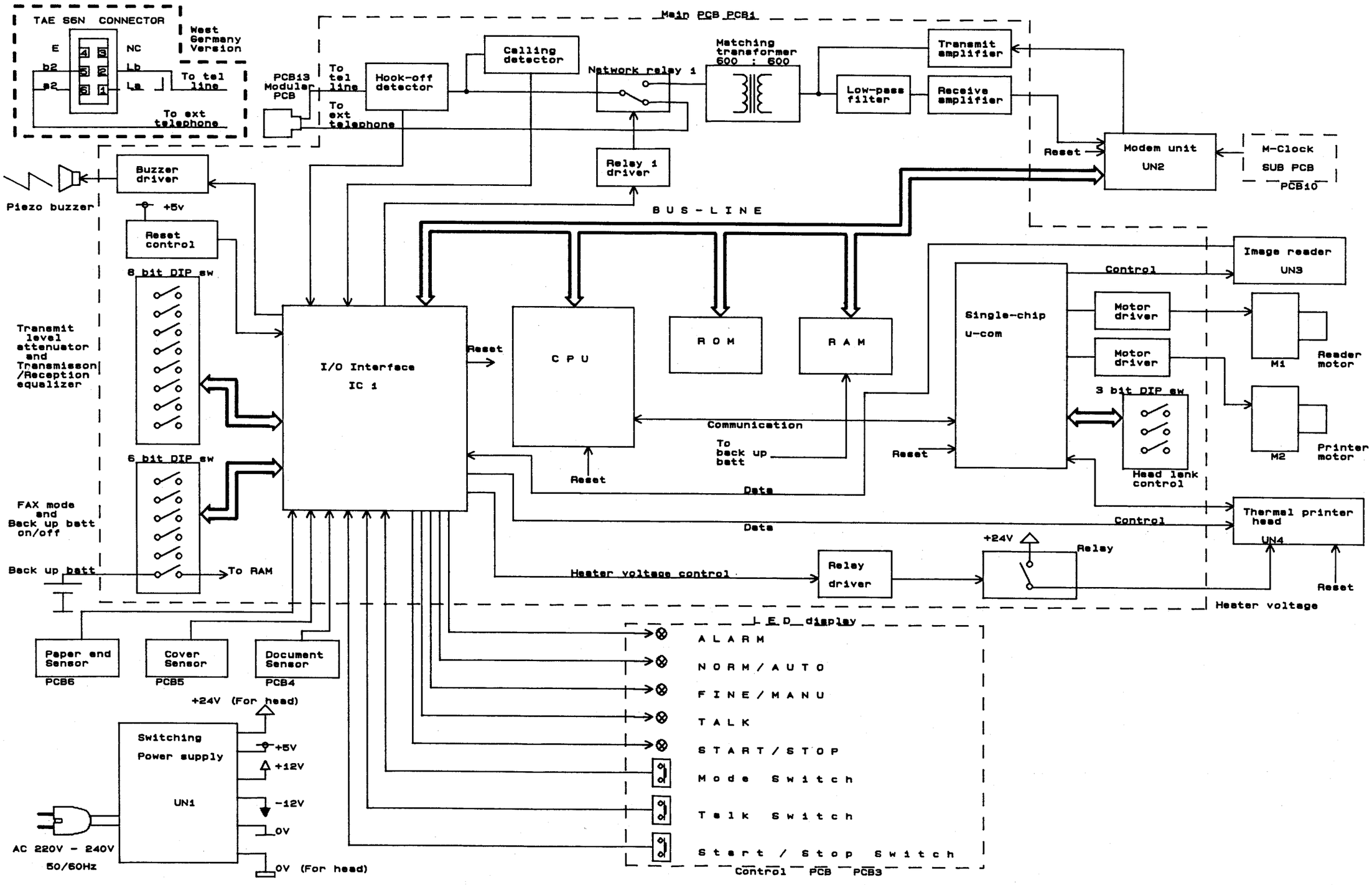
Pin no.	Terminal designation
11	+24V
12	PGND
13	PGND
14	PGND
15	PGND

Modem unit connector table

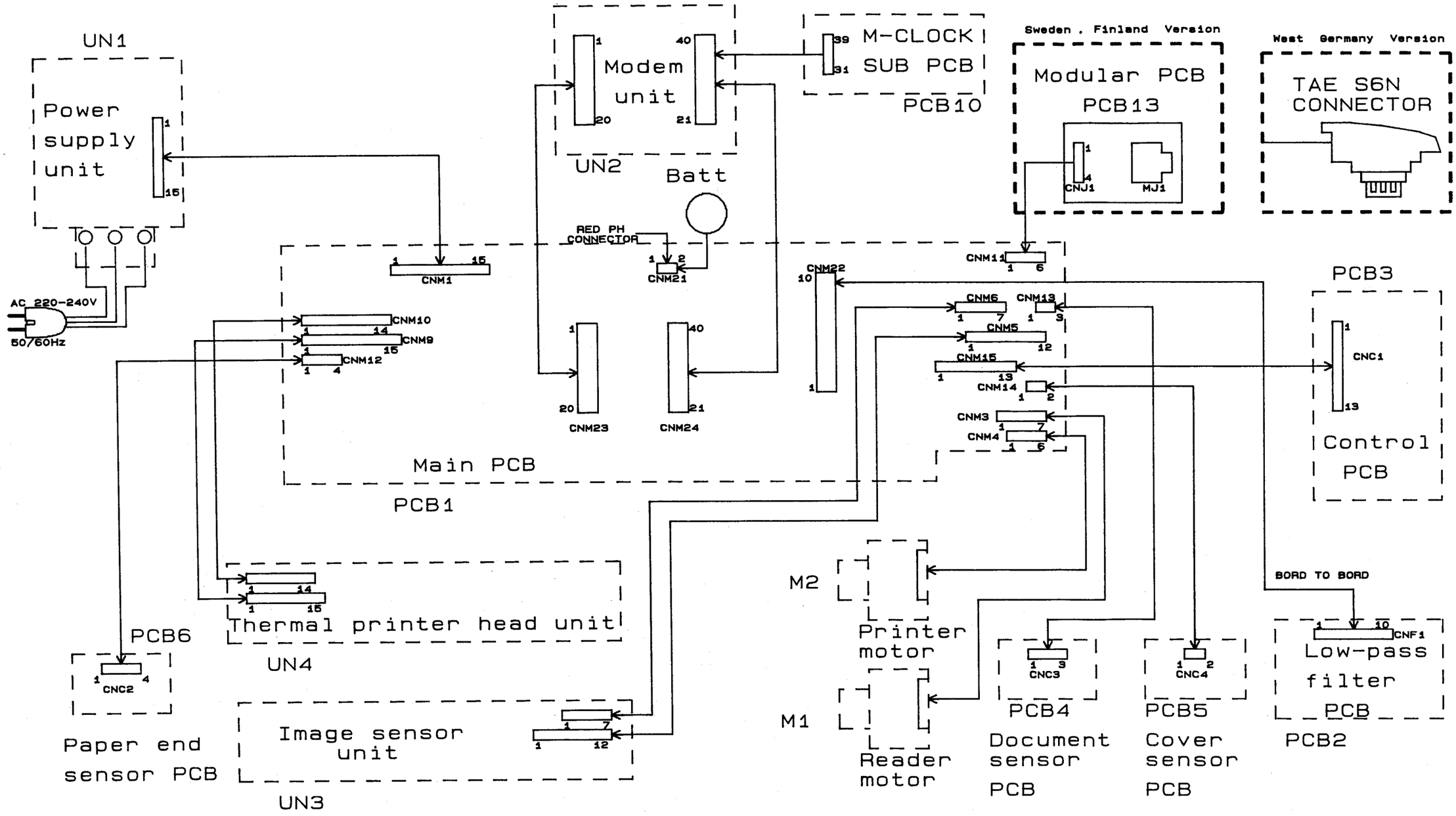
Signal name	Pin No.	Description
Ground	17,18	Power supply return
+5V	33,34	+5 volt supply
+12V	21	+12V volt supply
–12V	19	–12V volt supply
$\overline{POR}$	39	Power – on – reset
D7	9	Data bus (8 – bits)
D6	8	
D5	2	
D4	3	
D3	4	
D2	5	
D1	6	
D0	7	
RS3	13	Register select (4 – bits)
RS2	14	
RS1	15	
RS0	16	

Signal name	Pin No.	Description
$\overline{CS0}$	11	Chip select sample rate device
$\overline{CST}$	38	Chip select baud rate device
READ	10	Read enable
$\overline{WRITE}$	12	Write enable
$\overline{IRQ}$	1	interrupt request
DCLK	30	Unused
XCLK	31	External clock for Group 2
$\overline{RTS}$	32	Unused
$\overline{CTS}$	28	
TXD	27	
RXD	26	
$\overline{RLSD}$	29	
CABS1	24	Cable select 1
CABS2	25	Cable select 2
TXA	23	Transmitter analog output
RXA	22	Receiver analog input
NC	20,36 37,40	Unused

BLOCK DIAGRAM



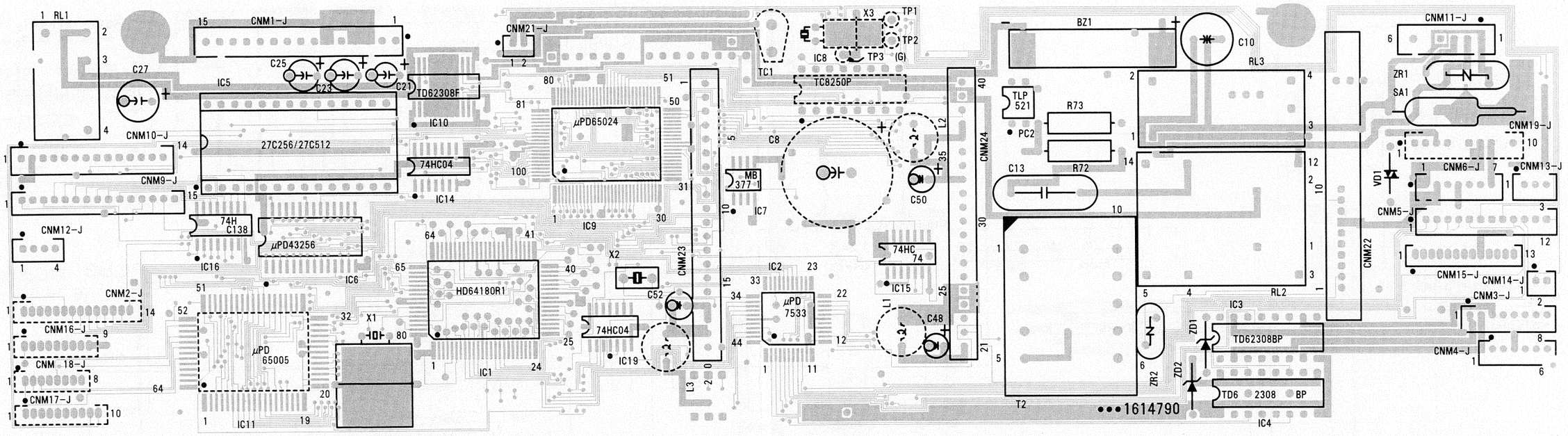
CONNECTING DIAGRAM



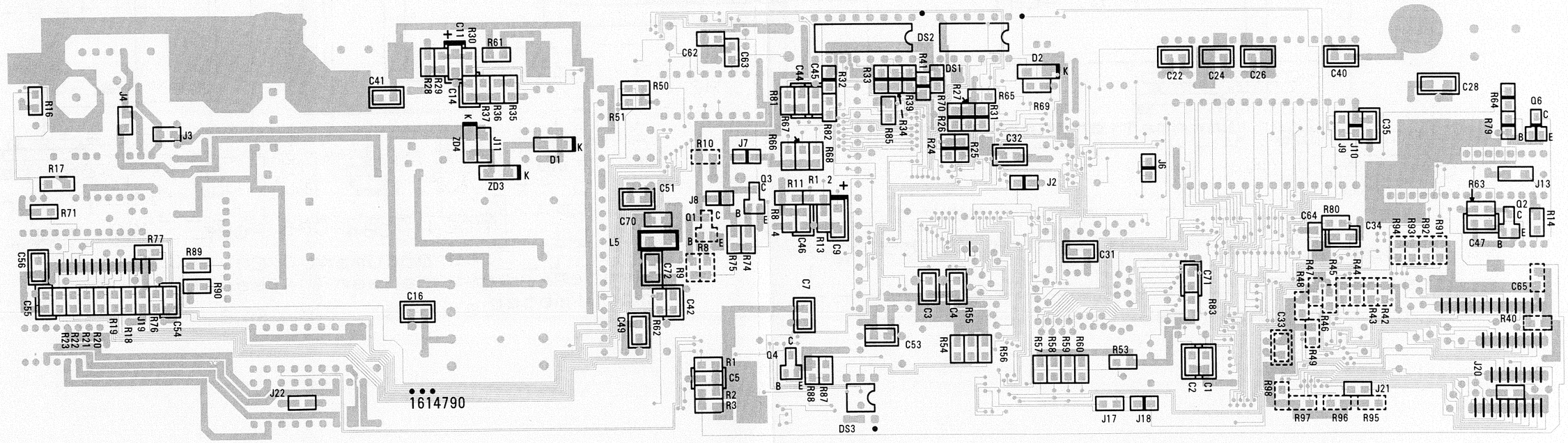
PARTS LAYOUT

1. MAIN PCB 1614790

(Top view)

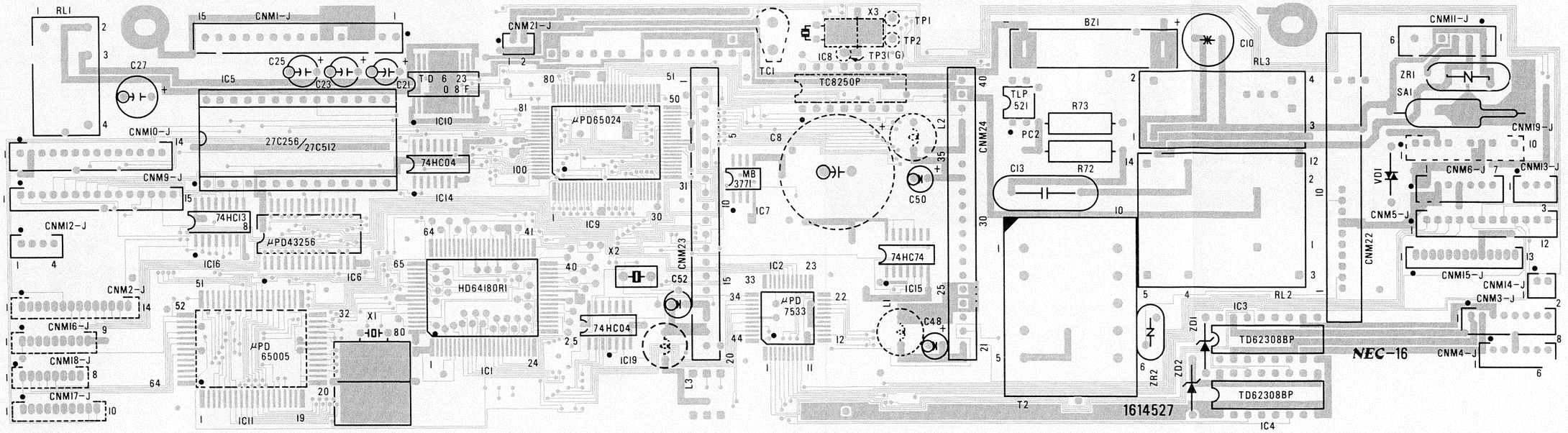


(Bottom view)

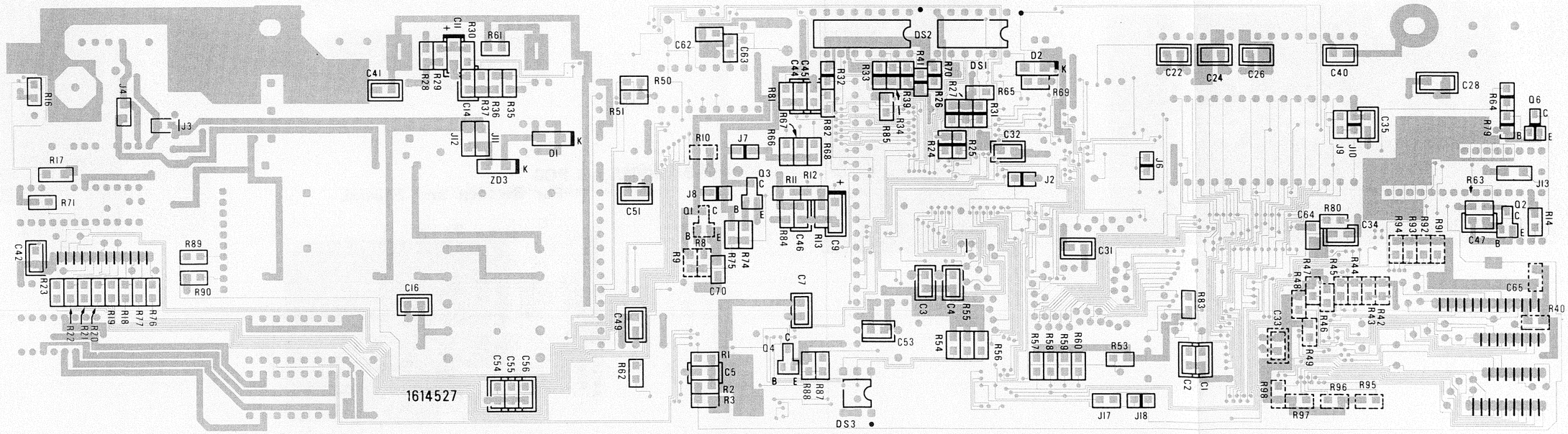


MAIN PCB 1614527

(Top view)

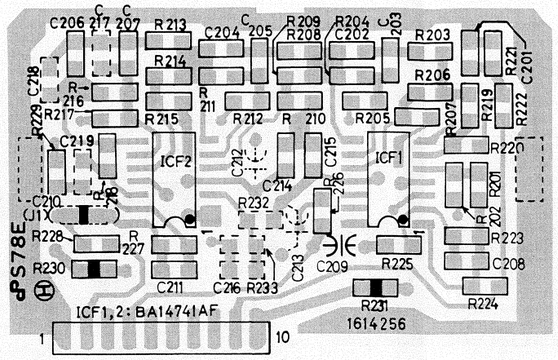


(Bottom view)

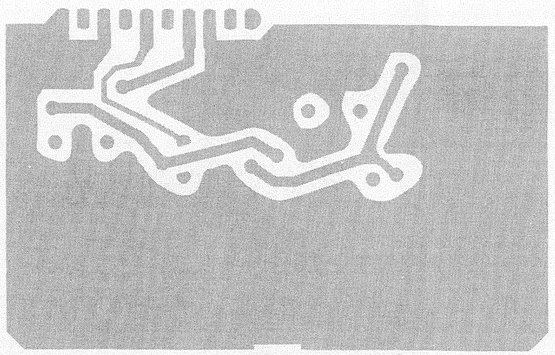


2. FILTER PCB

(Top view)

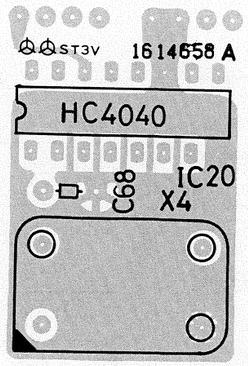


(Bottom view)

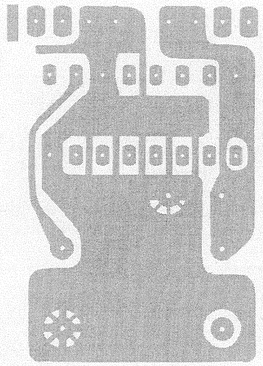


3. M – CLOCK SUB PCB

(Top view)

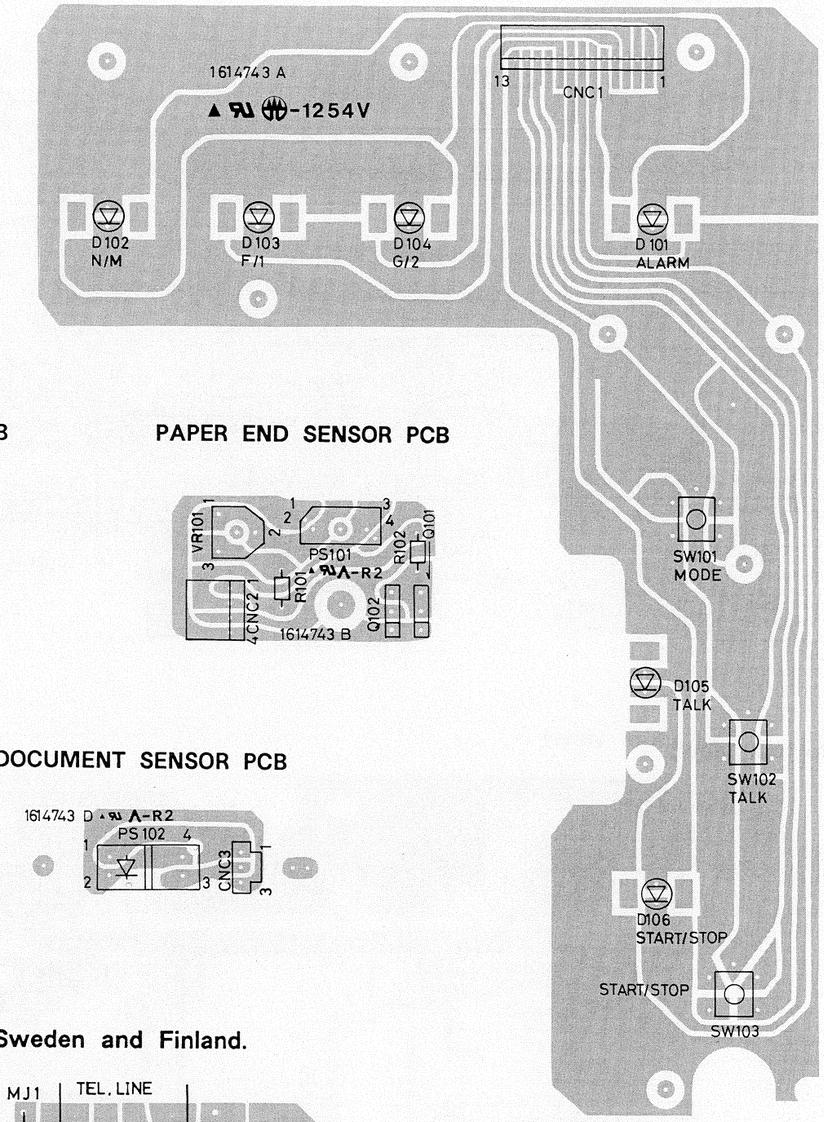


(Bottom view)



4. CONTROL & SENSORS PCB

CONTROL PCB

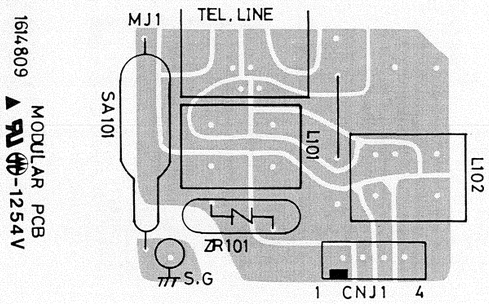


COVER SENSOR PCB

PAPER END SENSOR PCB

DOCUMENT SENSOR PCB

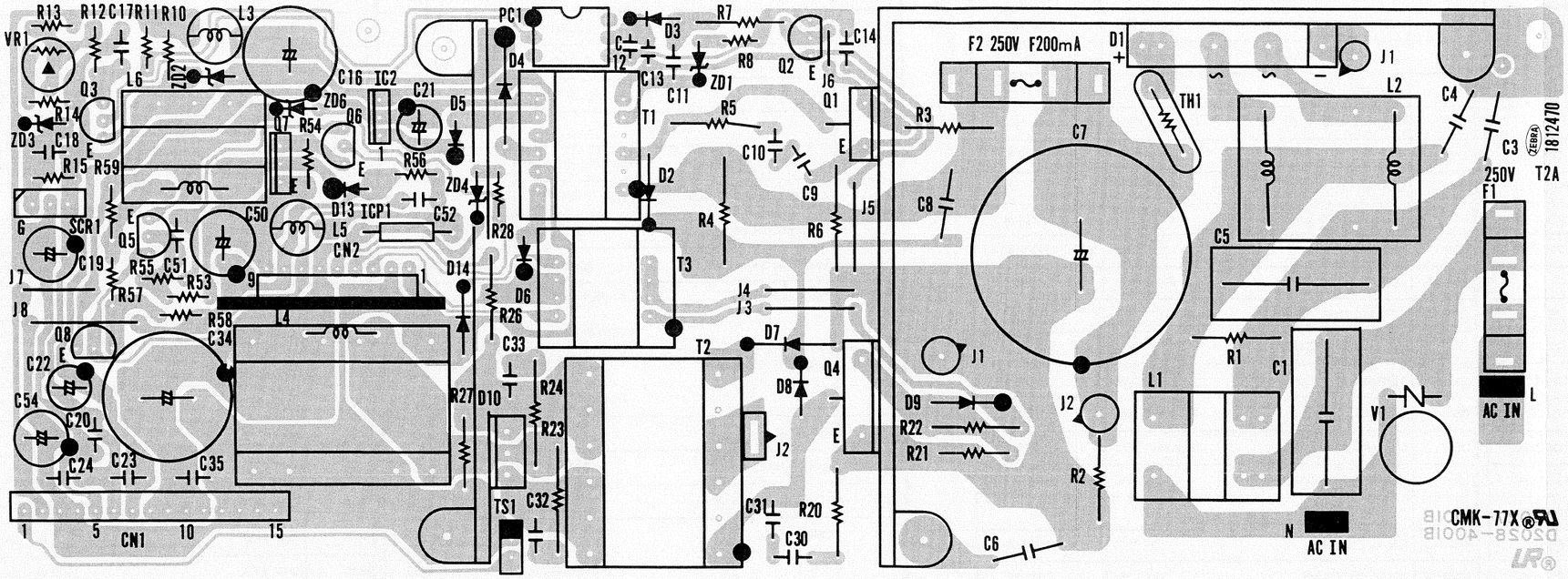
5. MODULAR PCB
…For Sweden and Finland.



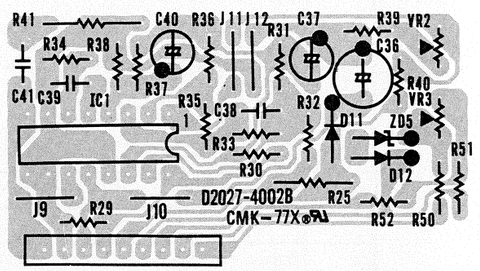
6. POWER SUPPLY & POWER SUPPLY SUB PCB

220V

POWER SUPPLY PCB 1812470

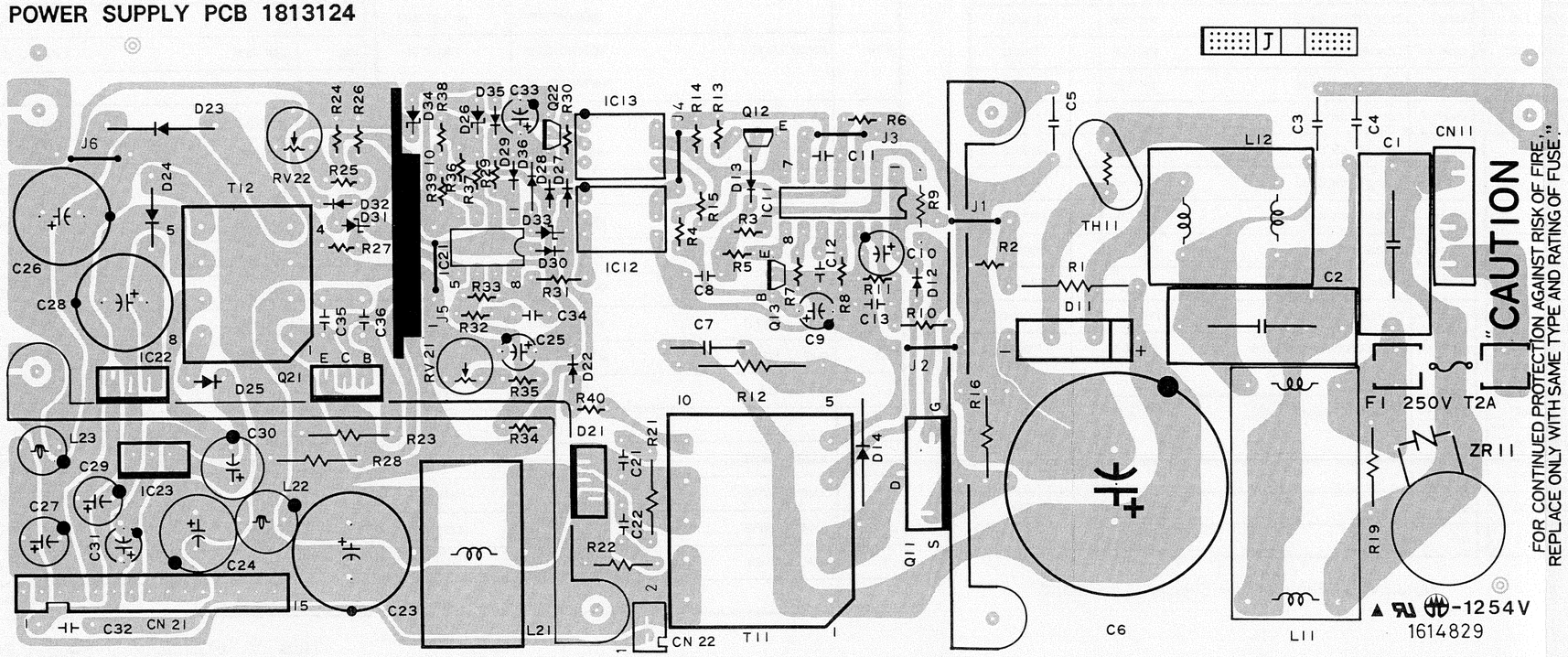


POWER SUPPLY SUB PCB

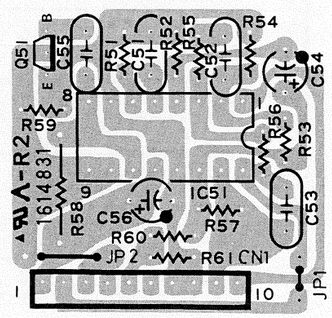


220V

POWER SUPPLY PCB 1813124



POWER SUPPLY SUB PCB



ELECTRICAL PARTS LIST

1. MAIN PCB

Ref.No.	Description		Part No.
	MAIN PCB ASS'Y		V : OSSA00035 S : OSSA00018 E : OSSA00031
	---CONSIST OF FOLLOWING; ---		
PCB1	MAIN PCB		1614790 or 1614527
BATT1	LITHIUM BATTERY	CR2450 – T – C4	1790785
BZ1	PIEZO BUZZER UNIT	PKM29EP – 2001	1812493
C1	CERAMIC CHIP CAP.	SL 22PF/50V	1271220C
C2	CERAMIC CHIP CAP.	SL 22PF/50V	1271220C
C3	CERAMIC CHIP CAP.	B 220PF/50V	12B3221C
C4	CERAMIC CHIP CAP.	B 220PF/50V	12B3221C
C5	CERAMIC CHIP CAP.	B 2200PF/50V	12B3222C
C7	CERAMIC CHIP CAP.	F 0.1uF/25V	12F2104C
C9	TANTALUM CHIP CAP.	1uF/16V	1225105C
C10	ELECTROLYTIC CAP.B.P.	100uF/16V	626U107
C11	TANTALUM CHIP CAP.	0.1uF/35V	1219104C
C13	METALIZED FILM CAP.	0.22uF/250V	122Z112
C14	CERAMIC CHIP CAP.	B 0.022uF/50V	12B3223C
C16	CERAMIC CHIP CAP.	B 0.022uF/50V	12B3223C
C21	ELECTROLYTIC CAP	100uF/6.3V	626A107
C22	CERAMIC CHIP CAP.	F 0.1uF/25V	12F2104C
C23	ELECTROLYTIC CAP.	100uF/16V	626C107
C24	CERAMIC CHIP CAP.	F 0.1uF/25V	12F2104C
C25	ELECTROLYTIC CAP.	100uF/16V	626C107
C26	CERAMIC CHIP CAP.	F 0.1uF/25V	12F2104C
C27	ELECTROLYTIC CAP.	100uF/35V	626E107
C28	CERAMIC CHIP CAP.	F 0.1uF/50V	72F3104C
C31	CERAMIC CHIP CAP.	F 0.1uF/25V	12F2104C
C32	CERAMIC CHIP CAP.	F 0.1uF/25V	12F2104C
C34	CERAMIC CHIP CAP.	F 0.1uF/25V	12F2104C
C35	CERAMIC CHIP CAP.	F 0.1uF/25V	12F2104C
C40	CERAMIC CHIP CAP.	F 0.033uF/50V	12B3333C
C41	CERAMIC CHIP CAP.	B 0.033uF/50V	12B3333C
C42	CERAMIC CHIP CAP.	B 220PF/50V	12B3221C

Ref.No.	Description		Part No.
C44	CERAMIC CHIP CAP.	SL 150PF/50V	1271151C
C45	CERAMIC CHIP CAP.	SL 150PF/50V	1271151C
C46	CERAMIC CHIP CAP.	F 0.1uF/25V	12F2104C
C47	CERAMIC CHIP CAP.	B 0.01uF/25V	12B2103C
C48	ELECTROLYTIC CAP.	47uF/16V	122Z428
C49	CERAMIC CHIP CAP.	F 0.1uF/25V	12F2104C
C50	ELECTROLYTIC CAP.	47uF/16V	122Z428
C51	CERAMIC CHIP CAP.	F 0.1uF/25V	12F2104C
C52	ELECTROLYTIC CAP.	47uF/16V	122Z428
C53	CERAMIC CHIP CAP.	F 0.1uF/25V	12F2104C
C54	CERAMIC CHIP CAP.	B 560PF/50V	12B3651C
C55	CERAMIC CHIP CAP.	B 560PF/50V	12B3651C
C56	CERAMIC CHIP CAP.	B 560PF/50V	12B3651C
C64	CERAMIC CHIP CAP.	F 0.1uF/25V	12F2104C
C70	CERAMIC CHIP CAP.	F 0.1uF/25V	12F2104C
CNM1 – J	CONNECTOR BASE	XH 15P	1770485
CNM3 – J	CONNECTOR BASE	PH 8P	1730830
CNM4 – J	CONNECTOR BASE	PH 6P	1730828
CNM5 – J	CONNECTOR BASE	PH 12P	1730834
CNM6 – J	CONNECTOR BASE	PH 7P	1730829
CNM9 – J	CONNECTOR BASE	PH 15P	1770831
CNM10 – J	CONNECTOR BASE	PH 14P	1770830
CNM11 – J	CONNECTOR BASE	XH 6P	1770832
CNM12 – J	CONNECTOR BASE	PH 4P	1730826
CNM13 – J	CONNECTOR BASE	PH 3P	170825
CNM14 – J	CONNECTOR BASE	PH 2P	1730824
CNM15 – J	CONNECTOR BASE	IL – Y 13P	1770497
CNM21 – J	CONNECTOR BASE	PH 2P	1770804
CNM23 – J	CONNECTOR RECEPTACLE	PS 20P	1700417 or 1700597
CNM24 – J	CONNECTOR RECEPTACLE	PS 20P	1700417 or 1700597
D1	DIODE	RLS – 94	RLS94
D2	DIODE	RLS – 94	RLS94

Note : V···W.Germany, S···Sweden, E···Finland

Ref.No.	Description		Part No.
DS1	DIP SWITCH	6 CIRCUITS	1621795
DS2	DIP SWITCH	8 CIRCUITS	1621748
DS3	DIP SWITCH	3 CIRCUITS	1621749
IC1	8 BIT MICROCOMPUTER	HD64180 – R1 – F6	14DH387
IC2	4BIT SINGLE – CHIP MICROCOMPUTER	uPD7533GB	14DV691
IC3	TRANSISTOR ARRAY	TD62308BP	14DW393
IC4	TRANSISTOR ARRAY	TD62308BP	14DW393
IC5	CMOS EP – ROM	uPD27C512D – 15	14DV493
		TC57512AD – 15	or 14DW656
IC6	CMOS STATIC RAM	uPD43256	14DV391
		MB84256 – 15LL	or 14D0501
IC7	RESET IC.	MB3771PF	14D0392
IC9	GATE ARRAY	uPD65024GF	14DV389
IC10	TRANSISTOR ARRAY	TD62308F	14DW394
IC14	CMOS LOGIC	TC74HC04AF	14DW699
		MB74HC04PF	or 14D0463
IC15	CMOS LOGIC	TC74HC74AF	14DW700
		MB74HC74PF	or 14D0464
IC16	CMOS LOGIC	TC74HC138AF	14DW701
		MB74HC138PF	or 14D0465
IC19	CMOS LOGIC	TC74HC04AF	14DW699
		MB74HC04PF	or 14D0463
J3	CHIP JUMPER	MCR10 – JPW	134F000C
J4	CHIP JUMPER	MCR10 – JPW	134F000C
J9	CHIP JUMPER	MCR10 – JPW	134F000C
J11	CHIP JUMPER	MCR18 – JPW	V : 134H000C
J13	CHIP JUMPER	MCR18 – JPW	134H000C
J17	CHIP JUMPER	MCR10 – JPW	134F000C
L1	JUMPER WIRE		1330909
L2	JUMPER WIRE		1330909
L3	JUMPER WIRE		1330909
L5	CHIP JUMPER	MCR18 – JPW	134H000C

Ref.No.	Description		Part No.
PC2	PHOTO COUPLER	TLP521 – 1	TLP521 – 1
Q2	TRANSISTOR	2SC2412KR	SC2412KR
Q3	TRANSISTOR	2SA1037K	2SA1037K
Q4	TRANSISTOR	2SC2412KR	SC2412KR
R1	CHIP RES.	1/10WJ 4.7k	134F472C
R2	CHIP RES.	1/10WJ 560k	134F564C
R3	CHIP RES.	1/10WF 33.2k	13E3322C
R11	CHIP RES.	1/10WJ 130k	134F134C
R12	CHIP RES.	1/10WJ 6.2k	134F622C
R13	CHIP RES.	1/10WJ 51k	134F513C
R14	CHIP RES.	1/10WJ 1k	134F102C
R16	CHIP RES.	1/10WJ 22k	134F223C
R17	CHIP RES.	1/8WJ 220	134H221C
R19	CHIP RES.	1/10WJ 360	134F361C
R20	CHIP RES.	1/10WJ 360	134F361C
R21	CHIP RES.	1/10WJ 510	134F511C
R22	CHIP RES.	1/10WJ 270	134F271C
R23	CHIP RES.	1/10WJ 510	134F511C
R28	CHIP RES.	1/10WJ 47k	134F473C
R29	CHIP RES.	1/10WJ 47k	134F473C
R30	CHIP RES.	1/10WJ 4.7k	134F472C
R35	CHIP RES.	1/10WJ 47k	134F473C
R36	CHIP RES.	1/10WJ 47k	134F473C
R37	CHIP RES.	1/10WJ 4.7k	134F472C
R50	CHIP RES.	1/10WJ 4.7k	134F472C
R51	CHIP RES.	1/10WJ 4.7k	134F472C
R53	CHIP RES.	1/10WJ 5.6k	134F562C
R54	CHIP RES.	1/10WJ 22k	134F223C
R55	CHIP RES.	1/10WJ 22k	134F223C
R56	CHIP RES.	1/10WJ 22k	134F223C
R57	CHIP RES.	1/10WJ 22k	134F223C
R58	CHIP RES.	1/10WJ 22k	134F223C
R59	CHIP RES.	1/10WJ 22k	134F223C
R60	CHIP RES.	1/10WJ 22k	134F223C

Note : V···W.Germany, S···Sweden, E···Finland

Ref.No.	Description		Part No.
R61	CHIP RES.	1/10WJ 4.7K	134F472C
R62	CHIP RES.	1/10WJ 100	134F101C
R63	CHIP RES.	1/10WJ 22k	134F223C
R65	CHIP RES.	1/10WJ 4.7k	134F472C
R66	CHIP RES.	1/10WJ 4.7k	134F472C
R67	CHIP RES.	1/10WJ 4.7k	134F472C
R68	CHIP RES.	1/10WJ 4.7k	134F472C
R69	CHIP RES.	1/10WJ 4.7k	134F472C
R71	CHIP RES.	1/10WJ 22k	134F223C
R72	METAL OXIDE RES.	1WJ 12k	134A123
R73	METAL OXIDE RES.	1WJ 8.2k	V : 134A822
R74	CHIP RES.	1/10WJ 1k	134F102C
R75	CHIP RES.	1/10WJ 100k	134F104C
R80	CHIP RES.	1/10WJ 220	134F221C
R81	CHIP RES.	1/10WJ 510	134F511C
R82	CHIP RES.	1/10WJ 510	134F511C
R83	CHIP RES.	1/10WJ 22k	134F223C
R84	CHIP RES.	1/10WJ 100	134F101C
R85	CHIP RES.	1/10WJ 22k	134F223C
R87	CHIP RES.	1/10WJ 8.2k	134F822C
R88	CHIP RES.	1/10WJ 10k	134F103C
R89	CHIP RES.	1/10WF 604	13E6040C
R90	CHIP RES.	1/10WF 604	13E6040C
R532	CARBON RES.	1/5WJ 1k	S,E 1324102
	ROM SEAL		24LH016
RL1	RELAY	LZ – 12VM	1680072
RL2	RELAY	MR24 – N36B	1680109
RL3	RELAY	URA – N1	1680110
SA1	SURGE ABSORBER	DSA302MA	S,V 1812614
T2	AUDIO TRANSFORMER	115T631	115T631

Ref.No.	Description		Part No.
VD1	SILICON VARISTOR	VR61SS	VR61SS
X1	CRYSTAL RESONATOR	12MHz	1811278
X2	CERAMIC RESONATOR	500kHz	1812474
ZD1	ZENER DIODE	05AZ39U	05AZ39U
ZD2	ZENER DIODE	MTZ12B	MTZ12B
ZD3	ZENER DIODE	RLZ24B	S,E RLZ24B
		RLZ6.8B	V : RLZ6.8Z
ZD4	ZENER DIODE	RLZ24B	S,E RLZ24B
ZR1	SURGE ABSORBER	ERZC14DK271	V,E 1812786
		ERZC14DK361	S 1812475
ZR2	SURGE ABSORBER	ERZC07DK390	1812651
	IC SOCKET	DICF – 28C – E	1730395

Note : V···W.Germany, S···Sweden, E···Finland

2. FILTER PCB

Ref.No.	Description	Part No.
	FILTER PCB ASS'Y	**OSSA00059**
	---CONSIST OF FOLLOWING ; ---	
PCB2	FILTER PCB	1614256
C201	CERAMIC CHIP CAP. CH 120PF	12CH121C
C202	CERAMIC CHIP CAP. CH 82PF	12CH820C
C203	CERAMIC CHIP CAP. CH 82PF	12CH820C
C204	CERAMIC CHIP CAP. CH 820PF	12CH821C
C205	CERAMIC CHIP CAP. CH 820PF	12CH821C
C206	CERAMIC CHIP CAP. CH 820PF	12CH821C
C207	CERAMIC CHIP CAP. CH 820PF	12CH821C
C208	CERAMIC CHIP CAP. CH 120PF	12CH121C
C209	ELECTROLYTIC CAP. B.P. 1uF/50V	626X105
C210	ELECTROLYTIC CAP. B.P. 1uF/50V	626X105
C211	CERAMIC CHIP CAP. CH 330PF	12CH331C
C212	ELECTROLYTIC CAP. 10uF/25V	626D106
C213	ELECTROLYTIC CAP. 10uF/25V	626D106
C214	CERAMIC CHIP CAP. B 0.01uF	12B2103C
C215	CERAMIC CHIP CAP. B 0.01uF	12B2103C
CNF1	COM CONNECTOR 10 PIN	1770650
ICF1	OP – AMP NJM2060M	NJM2060M
ICF2	OP – AMP BA14741AF	BA14741AF
R201	CHIP RES. 1/10WF 20.0K	13E2002C
R202	CHIP RES. 1/10WF 1.78K	13E1781C
R203	CHIP RES. 1/10WF 82.5K	13E8252C
R204	CHIP RES. 1/10WJ 1.5M	134F155C
R205	CHIP RES. 1/10WF 267K	13E2673C
R206	CHIP RES. 1/10WF 8.25K	13E8251C
R207	CHIP RES. 1/10WF 15.0K	13E1502C
R208	CHIP RES. 1/10WF 30.1K	13E3012C
R209	CHIP RES. 1/10WF 412K	13E4123C
R210	CHIP RES. 1/10WF 33.2K	13E3322C
R211	CHIP RES. 1/10WF 66.5K	13E6652C
R212	CHIP RES. 1/10WF 5.11K	13E5111C

Ref.No.	Description	Part No.
R213	CHIP RES. 1/10WF 33.2K	13E322C
R214	CHIP RES. 1/10WF 158K	13E1583C
R215	CHIP RES. 1/10WF 22.1K	13E2212C
R216	CHIP RES. 1/10WF 35.7K	13E3572C
R217	CHIP RES. 1/10WF 12.1K	13E1212C
R218	CHIP RES. 1/10WF 5.62K	13E5621C
R219	CHIP RES. 1/10WF 10.0K	13E1002C
R220	CHIP RES. 1/10WF 10.0K	13E1002C
R221	CHIP RES. 1/10WF 10.0K	13E1002C
R222	CHIP RES. 1/10WF 20.0K	13E2002C
R223	CHIP RES. 1/10WF 61.9K	13E6192C
R224	CHIP RES. 1/10WF 604	13E6040C
R225	CHIP RES. 1/10WF 22.1K	13E2212C
R226	CHIP RES. 1/10WF 604	13E6040C
R227	CHIP RES. 1/10WF 75.0K	13E7502C
R228	CHIP RES. 1/10WF 604	13E6040C
R229	CHIP RES. 1/10WF 5.62K	13E5621C

Note : V···W.Germany, S···Sweden, E···Finland

3. M – CLOCK SUB PCB

Ref.No.	Description	Part No.
	M – CLOCK SUB PCB ASS'Y	**0SSA00060**
	– – – CONSIST OF FOLLOWING ; – – –	
PC810	M – CLOCK SUB PCB	1614658
C68	CERAMIC CAP. 0.01uF/16V	3Y2D103
IC20	C – MOS LOGIC TC74HC4040P	14DW365
X4	CRYSTAL OSCILLATOR 10,6116832MHz	1813013 or 1813014 or 1813015

4. CONTROL PCB

Ref.No.	Description	Part No.
	CONTROL PCB ASS'Y	**OSSA00039**
	– – – CONSIST OF FOLLOWING ; – – –	
PCB3	CONTROL PCB	1614856
	(CONTROL BLOCK)	
CNC1	CONNECTOR BASE ILY 13P	1770511
D101	LED (RED) SLR – 34VR	1401410
D102	LED (GREEN) SLR – 34MG	1401408
D103	LED (GREEN) SLR – 34MG	1401408
D105	LED (RED) SLR – 34VR	1401410
D106	LED (ORANGE) SLR – 34DU	1401409
SW101	TACT SWITCH SKHHAJ0001	5622017
SW102	TACT SWITCH SKHHAJ0001	5622017
SW103	TACT SWITCH SKHHAJ0001	5622017
PCB6	(PAPER END SENSOR BLOCK)	
CNC2	CONNECTOR BASE PH 4P	1730837
PS101	REFLECTIVE PHOTOSENS ON2153 – CA	1812469
Q101	TRANSISTOR 2SC2021 R	2SC2021 R
Q102	TRANSISTOR 2SC2021 R	2SC2021 R
R101	CARBON RES. 1/5WJ 180	1324181
R102	CARBON RES. 1/5WJ 43k	1324433
VR101	TRIMMER RES. 1/10WJ 500	138J697
PCB5	(COVER SENSOR BLOCK)	
SW104	MICRO SWITCH SSCT	1624160
CNC4	BOARD IN CONNECTOR 2P	WIRE ASS'Y (C)
PCB4	(DOCUMENT SENSOR BLOCK)	
PS102	PHOTO INTERRUPTER TLP806	1812468
CNC3	BOARD IN CONNECTOR 3P	WIRE ASS'Y (B)

Note : V···W.Germany, S···Sweden, E···Finland

5. MODULAR PCB

Ref.No.	Description	Part No.
	MODULAR PCB ASS'Y	**S,E 0SSA00048**
	---CONSIST OF FOLLOWING ; ---	
PC83	MODULAR PCB	1614809
CNJ1	BOARD IN CONNECTOR	WIRE ASS'Y (E)
L101	NOISE FILTER	1170644
L102	NOISE FILTER	1170644
MJ1	MODULAR LACK	160394
	JUMPER 10mm	———

6. OTHER PARTS

Ref.No.	Description	Part No.
UN1	POWER SUPPLY UNIT	1812124 or 1812470
UN2	CARD MODEM UNIT R96MD	1813007
UN3	IMAGE SENSOR UNIT DWPCA4506	18012472
UN4	THERMAL PRINT HEAD UNIT KF2008-102	1812904
M1	STEPRING MOTOR (READER) STP-42CA48LH FF-100 R	1640302 or 1640356
M2	STEPPING MOTOR (PRINTER) FF-100	1640349
	WIRE TIE PLT-1M	1790356
	WIRE TIE PLT-0.7M	1790571
	FERRITE CORE HF70RU12×15×7.3	1190030
	FERRITE CORE	1190036
	AC PLUG CORD SET	5750051
	CABLE ASS'Y	**V: 1760722**
	---CONSIST OF FOLLOWING ; ---	
	TEL CABLE	V: 1760672
	TAE PLUG	V: 1730399
	RING CORE	V: 1190029

Note : V···W.Germany, S···Sweden, E···Finland

Ref.No.	Description	Part No.
	PAPER END SENSOR WIRE ASSEMBLY 4Pin	WIRE ASS'Y (A)
	CONTROL WIRE ASSEMBLY 13Pin	WIRE ASS'Y (D)
	MODULAR WIRE ASSEMBLY 4Pin	S,E WIRE ASS'Y (E)
	IMAGE SENSOR WIRE ASSEMBLY 12Pin	WIRE ASS'Y (F)
	IMAGE SENSOR WIRE ASSEMBLY 7Pin	WIRE ASS'Y (G)
	THERMAL PRINT HEAD WIRE ASSEMBLY 14Pin	WIRE ASS'Y (H)
	THERMAL PRINT HEAD WIRE ASSEMBLY 15Pin	WIRE ASS'Y (I)
	MOTOR WIRE ASSEMBLY GREEN	WIRE ASS'Y (J)
	THERMAL PRINT HEAD WIRE ASSEMBLY GRAY	WIRE ASS'Y (K)
	IMAGE SENSOR WIRE ASSEMBLY GRAY	WIRE ASS'Y (L)
	HINGE WIRE ASSEMBLY (L) GRAY	WIRE ASS'Y (M)
	ROLL PAPER HOLDER WIRE ASSEMBLY GRAY	WIRE ASS'Y (N)
	HINGE WIRE ASSEMBLY (R) GRAY	WIRE ASS'Y (O)
	CABINET WIRE ASSEMBLY GRAY	V : WIRE ASS'Y (P)

Note : V···W.Germany, S···Sweden, E···Finland

7. POWER SUPPLY PCB

Ref.No.	Description	Part No.
	POWER SUPPLY UNIT PCB ASS'Y	1614829X
	- - - CONSIT OF FOLLOWING ; - - -	
	POWER SUPPLY PCB	1614829
C1	CAP. ECQ - U2A 224MT	122Z514
	XE 0.22uF M	or 122Z515
	B81121 - C - B127	or 122Z511
C2	CAP. ECQ - U2A 224MT	122Z514
	XE 0.22uF M	or 122Z515
	B81121 - C - B127	or 122Z511
C3	CAP. DE7100 F222M VA1 KC	1220621
	ECK DNS222ME	or 122Z512
C4	CAP. DE7100 F222M VA1 KC	1220621
	ECK DNS222ME	or 122Z512
C5	CAP. DE7100 F222M VA1 KC	1220621
	ECK DNS222ME	or 122Z512
C6	ELECTROLYTIC CAP. 270uF/400V	122Z499
C7	METALLIZED FILM CAP. 0.022uF/630V	122Z521
C8	FILM CAP. 1000PF/50V	1250102S
C9	ELECTROLYTIC CAP. 10uF/50V	226F106U
C10	ELECTROLYTIC CAP. 33uF/50V	226F336U
C11	FILME CAP. 0.22uF/50V	1250224S
C12	FILME CAP. 470PF/50V	1250471S
IC13	FILME CAP. 4700PF/50V	1250472S
C21	CERAMIC CAP. B 470PF/500V	122Z513S
		or 122Z516S
C22	CERAMIC CAP. B 470PF/500V	122Z513S
		or 122Z516S
C23	ELECTROLYTIC CAP. 2200uF/35V	122Z517
C24	ELECTROLYTIC CAP. 220uF/35V	226F227U
C25	ELECTROLYTIC CAP. 10uF/50V	226F106U
C26	ELECTROLYTIC CAP. 3300uF/10V	122Z519
C27	ELECTROLYTIC CAP. 220uF/10V	226B227U
C28	ELECTROLYTIC CAP. 1000uF/25V	122Z518

Ref.No.	Description	Part No.
C29	ELECTROLYTIC CAP. 47uF/25V	226D476U
C30	ELECTROLYTIC CAP. 220uF/25V	226D227U
C31	ELECTROLYTIC CAP. 47uF/25V	226D476U
C32	METALLIZED FILM CAP. 0.22uF/100V	122Z522
C33	ELECTROLYTIC CAP. 47uF/25V	226D476U
C34	FILME CAP. 6800PF/50V	1250682S
C35	FILME CAP. 2200PF/200V	122Z520S
C36	FILME CAP. 2200PF/200V	122Z520S
CN11	CONNECTOR RTB - 1.5 - 3V	1780166
D11	BRIDGE DIODE KBP06M	KBP06M
D12	FAST RECOVERY DIODE 1SS132	1SS132T
D13	FAST RECOVERY DIODE 1SS133	1SS133T
D14	FAST RECOVERY DIODE ERB38 - 06	ERB38 - 06
	RU24M	or RU24M
D21	FAST RECOVERY DIODE ESAC92M - 02	AC92M - 02
D22	FAST RECOVERY DIODE 1SS132	1SS132T
D23	SCHOTTKY DIODE ERB81 - 004	RB81 - 004
	SB3405009L	405009L
D24	SCHOTTKY DIODE ERB83 - 006	RB83 - 006
	SB360	SB360
D25	FAST RECOVERY DIODE ERA38 - 06	ERA38 - 06
	ERA38 - 04	or ERA38 - 04
	AU02 (Z)	or AU02
D26	ZENER DIODE RD5.6ESB1	5.6ESB1T
	RD5.6ESB2	or 5.6ESB2T
	RD5.1ESB3	or 5.1ESB3T
D27	FAST RECOVERY DIODE 1SS133	1SS133T
D28	FAST RECOVERY DIODE 1SS133	1SS133T
D29	FAST RECOVERY DIODE 1SS133	1SS133T
D30	FAST RECOVERY DIODE 1SS133	1SS133T
D31	ZENER DIODE RD2.7ESB	D2.7ESBT
D32	FAST RECOVERY DIODE 1SS133	1SS133T

Note : V···W.Germany, S···Sweden, E···Finland

Ref.No.	Description		Part No.
D33	ZENER DIODE	RD27ESB1	D27ESB1T
		RD27ESB2	or D27ESB2T
		RD24ESB4	or D24ESB4T
D34	ZENER DIODE	RD5.6ESB1	5.6ESB1T
		RD5.6ESB2	or 5.6ESB2T
		RD5.1ESB3	or 5.1ESB3T
D35	FAST RECOVERY DIODE	1SS133	1SS133T
D36	FAST RECOVERY DIODE	1SS133	1SS133T
F1	FUSE	SET 250V 2A	5790051
IC11	IC	M51978P	14LU506
IC12	PHOTO COUPLER	PC111	1813254
		PC113	or 1813255
IC13	PHOTO COUPLER	PC111	1813254
		PC113	or 1813255
IC21	OP – AMP	NJM2904D	14L0222
		uPC358C	or 14LV512
IC22	3 – TERMINAL REGULATOR	NJM7812FA	14L0251
		(12V – 1A)	
IC23	3 – TERMINAL REGULATOR	NJM78M12FA	14L0238
		(12V – 0.5A)	
L11	LINE FILTER COIL	SU17V – 10100	1150894
L12	LINE FILTER COIL	SU16V – 15015	1150900
		SU16V – 10060	1150895
L13	FERRITE BEAD	B – 20F – 28	1190052
L21	CHOKE COIL	SHP – 053	1150896
L22	CHOKE COIL	SBC4 – 4R7 – 582	1150897
L23	CHOKE COIL	SBC2 – 100 – 212	1150898
Q11	POWER MOS FET	2SK955	2SK955
Q12	TRANSISTOR	2SA1175	2SA1175T
		2SA1317	or 2SA1317
Q13	TRANSISTOR	2SA1175	2SA1175T
		2SA1317	or 2SA1317

Ref.No.	Description		Part No.
Q21	TRANSISTOR	2SC3692	2SC3692T
		2SC3747	or 2SC3747
Q22	TRANSISTOR	DTC114ESZ	TC114ESZ
R1	METAL OXIDE RES.	220k Ω 2W	1330932
R2	CARBON RES.	18k Ω 1/4W	1324183T
R3	CARBON RES.	22k Ω 1/4W	1324223T
R4	CARBON RES.	33k Ω 1/4W	1324333T
R5	CARBON RES.	10k Ω 1/4W	1324103T
R6	CARBON RES.	3.9k Ω 1/4W	1324392T
R7	CARBON RES.	15k Ω 1/4W	1324153T
R8	CARBON RES.	15k Ω 1/4W	1324153T
R9	CARBON RES.	33 Ω 1/4W	1330936T
			or 1330939T
R10	CARBON RES.	33 Ω 1/4W	1324330T
R11	CARBON RES.	560 Ω 1/4W	1324561T
R12	METAL OXIDE RES.	47k Ω 3W	1330933
R13	CARBON RES.	22k Ω 1/4W	1324223T
R14	CARBON RES.	22k Ω 1/4W	1324223T
R15	CARBON RES.	10k Ω 1/4W	1324103T
R16	METAL FILME RES.	0.1 Ω 1/2W	1330931
R19	CARBON RES.	560k Ω 1/2W	1322564T
R21	FUSE RES.	39 Ω 1/4W	1330934T
			or 1330937T
R22	FUSE RES.	22 Ω 1/4W	1330935T
			or 1330938T
R23	CARBON RES.	66 Ω 1/2W	1322680T
R24	CARBON RES.	2.7k Ω 1/4W	1324272T
R25	CARBON RES.	2.2k Ω 1/4W	1327222T
R26	CARBON RES.	18k Ω 1/4W	1324183T
R27	CARBON RES.	470 Ω 1/4W	1324471T
R28	METAL FILME RES.	0.1 Ω 1/2W	1330931
R29	CARBON RES.	15k Ω 1/4W	1324153T
R30	CARBON RES.	2.2k Ω 1/4W	1324222T
R31	CARBON RES.	2.2k Ω 1/4W	1324222T
R32	CARBON RES.	47k Ω 1/4W	1324473T

Note : V···W.Germany, S···Sweden, E···Finland

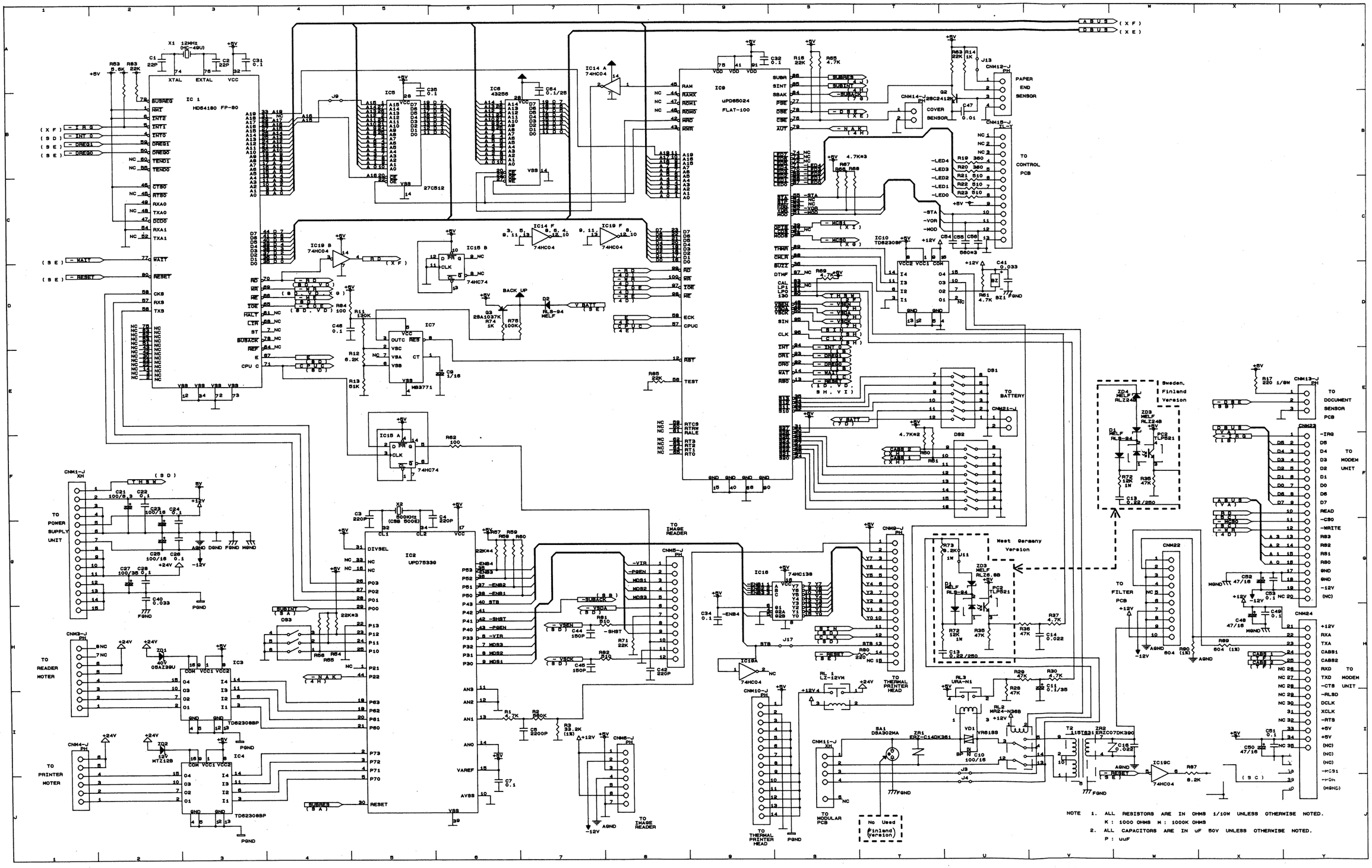
Ref.No.	Description	Part No.
R33	CARBON RES. 220k Ω 1/4W	1324224T
R34	CARBON RES. 22k Ω 1/4W	1324223T
R35	CARBON RES. 2.2k Ω 1/4W	1324222T
R36	CARBON RES. 10k Ω 1/4W	1324103T
R37	CARBON RES. 10k Ω 1/4W	1324103T
R38	CARBON RES. 1k Ω 1/4W	1324102T
R39	CARBON RES. 4.7k Ω 1/4W	1324472T
R40	CARBON RES. 10 Ω 1/4W	1324100T
RV21	CARBON TRIMMER RES. 1kΩ RVF6P51 – 5 – 102N	2380098
RV22	CARBON TRIMMER RES. 1kΩ RVF6P51 – 5 – 102N	2380098
T11	TRANSFORMER (MAIN) FAX PT – 2	115E882
T12	TRANSFORMER (DC – DC) FAX PT – 1	115E881
TH11	THERMISTER 16D – 13	16D – 13
Z – 11	SURGE ABSOBER ENC471D – 14A	1813224

Ref.No.	Description	Part No.
	POWER SUPPLY SUB PCB ASS'Y	**1614831X**
	– – – CONSIST OF FOLLOWING : – – –	
	POWERSUPPLY SUB PCB	1614831
CN1	CONNECOTR MB10P 90S	1700720
C51	FILME CAP. 4700PF/50V	1250472S
C52	FILME CAP. 0.022uF/50V	1250223S
C53	FILME CAP. 0.1uF/50V	1250104S
C54	ELECTROLYTIC COP. 100uF/10V	226B107U
C55	FILME CAP. 1000PF/50V	1250102S
C56	ELECTROLYTIC CAP. 22uF/50V	226F226U
IC51	IC MB3759M – G	14L0513
Q51	TRANSISTOR DTC114ESZ	TC114ESZ
R51	CARBON RES. 2.2k Ω 1/4W	1324222T
R52	CARBON RES. 470 Ω 1/4W	1324471T
R53	CARBON RES. 4.7k Ω 1/4W	1324472T
R54	CARBON RES. 4.7k Ω 1/4W	1324472T
R55	CARBON RES. 10k Ω 1/4W	1324103T
R56	CARBON RES. 10 Ω 1/4W	1324100T
R57	CARBON RES. 220k Ω 1/4W	1324224T
R58	CARBON RES. 560 Ω 1/2W	1322561T
R59	CARBON RES. 470 Ω 1/4W	1324471T
R60	CARBON RES. 4.7k Ω 1/4W	1324472T
R61	CARBON RES. 4.7k Ω 1/4W	1324472T
———	SWITCH JWZ2120 – 0105	1623356
———	THERMAL REED SWITCH OHD3 – 80B	5790053
———	AC INLET M1724	1710101
	WIRE ASSEMBLY 3PIN WIRE ASS'Y(A)	
	WIRE ASSEMBLY GREEN/YELLOW WIRE ASS'Y(B)	
	WIRE ASSEMBLY BLUE WIRE ASS'Y(C)	
	WIRE ASSEMBLY BROWN WIRE ASS'Y(D)	
	WIRE ASSEMBLY 2PIN WIRE ASS'Y(E)	
	WIRE ASSEMBLY 15PIN WIRE ASS'Y(F)	
	SUMI TUBE F2 5 × 0.15	
	SUMI TUBE F2 3 × 0.15	
	FUSE HOLDER H – 0011	5790052

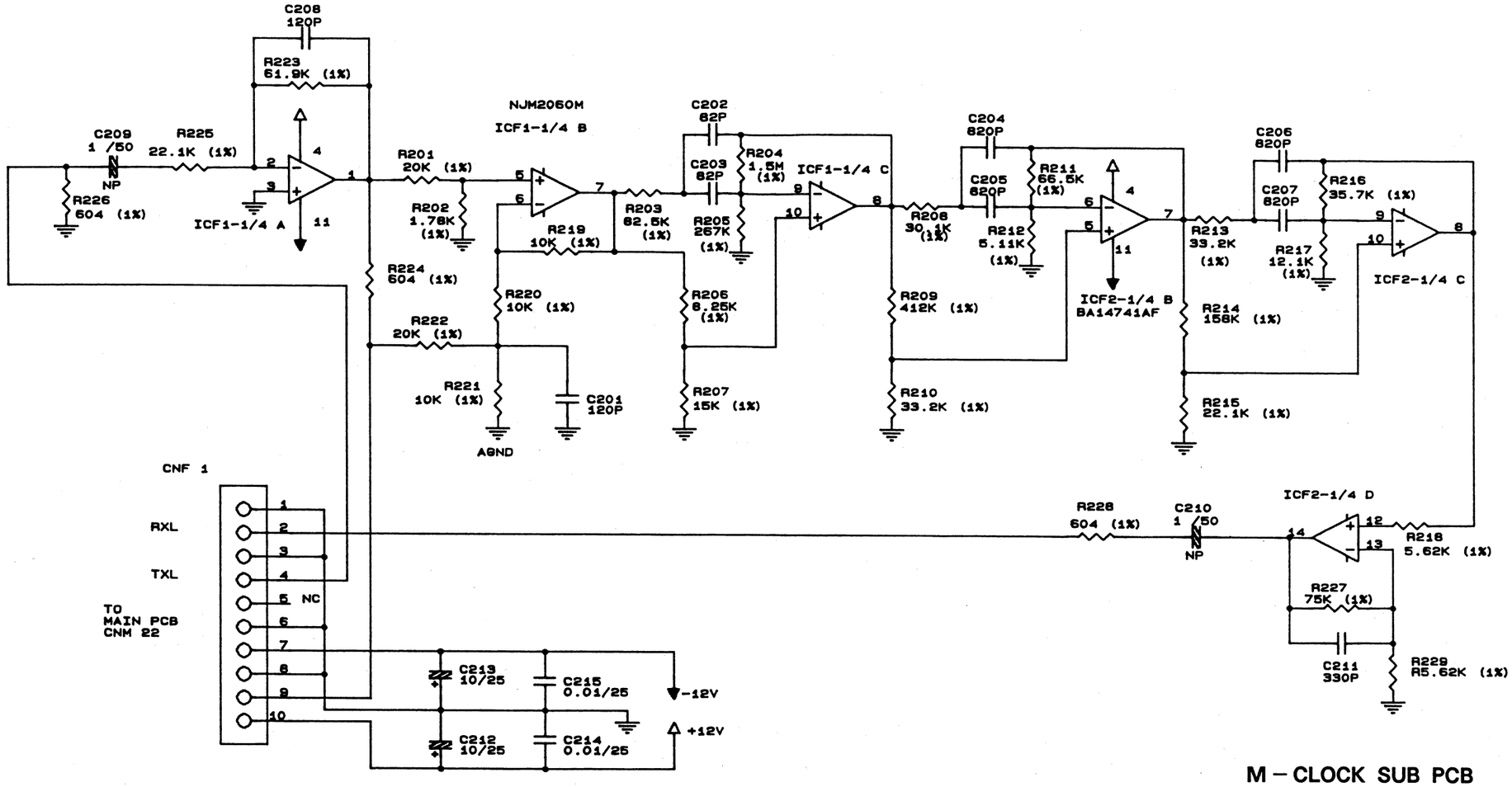
Note : V···W.Germany, S···Sweden, E···Finland

SCHEMATIC DIAGRAM

1. MAIN PCB

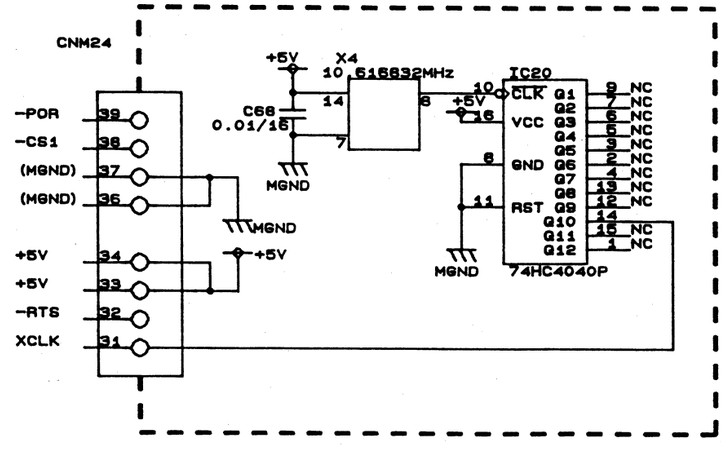


2. FILTER & M – CLOCK SUB PCB
FILTER PCB

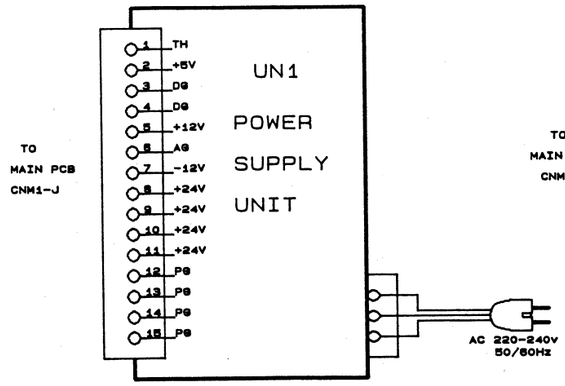


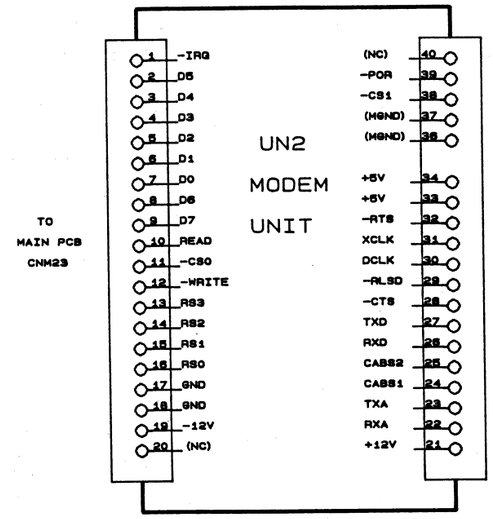
NOTE 1. ALL RESISTORS ARE IN OHMS 1/10W UNLESS OTHERWISE NOTED.
K : 1000 OHMS M : 1000K OHMS
2. ALL CAPACITORS ARE IN uF 50V UNLESS OTHERWISE NOTED.
P : uuF

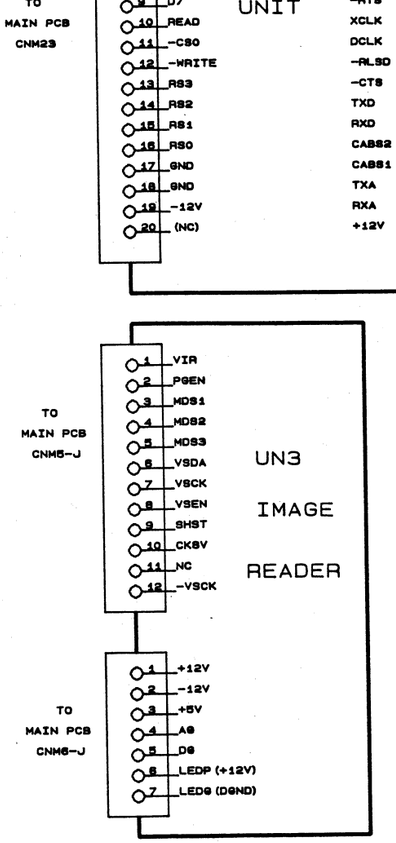
M – CLOCK SUB PCB

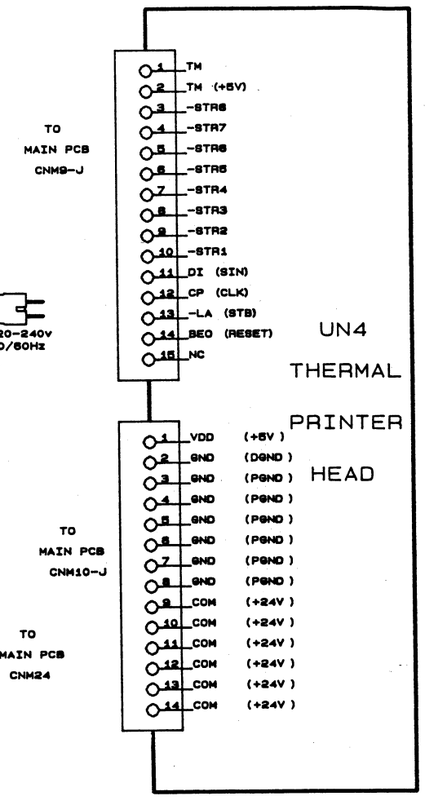


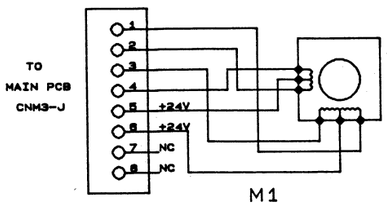
3. PERIPHERY

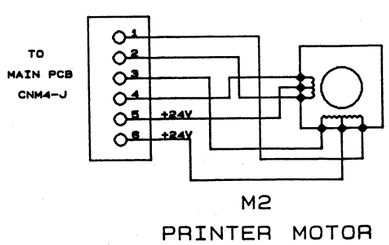

UN1
POWER
SUPPLY
UNIT
TO
MAIN PCB
CNM1-J
1 TH
2 +5V
3 DG
4 DG
5 +12V
6 AG
7 -12V
8 +24V
9 +24V
10 +24V
11 +24V
12 PG
13 PG
14 PG
15 PG
AC 220-240V
50/60Hz

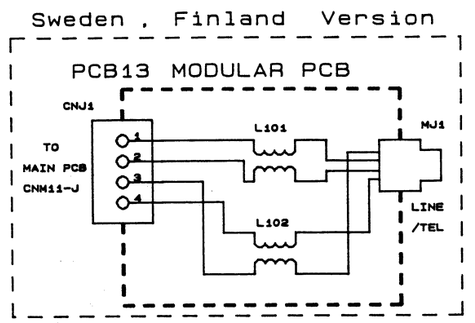

UN2
MODEM
UNIT
TO
MAIN PCB
CNM23
1 -IRQ
2 D5
3 D4
4 D3
5 D2
6 D1
7 D0
8 D6
9 D7
10 READ
11 -CS0
12 -WRITE
13 RS3
14 RS2
15 RS1
16 RS0
17 GND
18 GND
19 -12V
20 (NC)
(NC) 40
-POR 39
-CS1 38
(HGND) 37
(HGND) 36
+5V 34
+5V 33
-RTS 32
XCLK 31
DCLK 30
-RLSD 29
-CTS 28
TXD 27
RXD 26
CABS2 25
CABS1 24
TXA 23
RXA 22
+12V 21

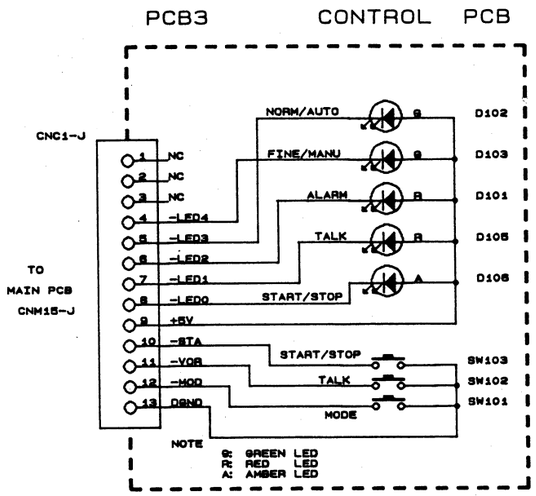

UN3
IMAGE
READER
TO
MAIN PCB
CNM5-J
1 VIR
2 PGEN
3 MDS1
4 MDS2
5 MDS3
6 VSDA
7 VSCK
8 VSEN
9 SHST
10 CK8V
11 NC
12 -VSCK
TO
MAIN PCB
CNM6-J
1 +12V
2 -12V
3 +5V
4 AG
5 DG
6 LEDP (+12V)
7 LEDG (DGND)

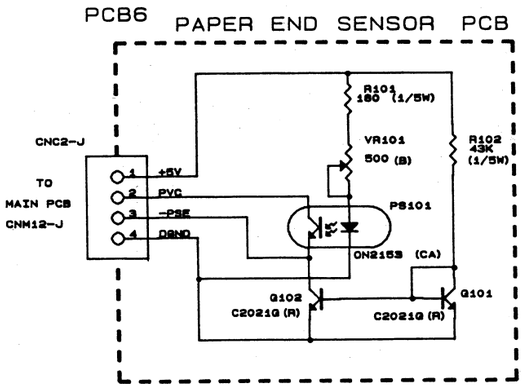

UN4
THERMAL
PRINTER
HEAD
TO
MAIN PCB
CNM9-J
1 TH
2 TH (+5V)
3 -STR8
4 -STR7
5 -STR6
6 -STR5
7 -STR4
8 -STR3
9 -STR2
10 -STR1
11 DI (SIN)
12 CP (CLK)
13 -LA (STB)
14 BEQ (RESET)
15 NC
TO
MAIN PCB
CNM10-J
1 VDD (+5V)
2 GND (DGND)
3 GND (PGND)
4 GND (PGND)
5 GND (PGND)
6 GND (PGND)
7 GND (PGND)
8 GND (PGND)
9 COM (+24V)
10 COM (+24V)
11 COM (+24V)
12 COM (+24V)
13 COM (+24V)
14 COM (+24V)

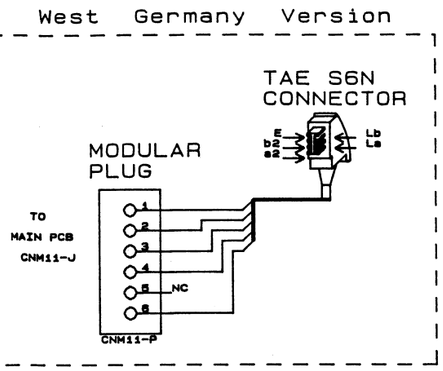

TO
MAIN PCB
CNM3-J
1
2
3
4
5 +24V
6 +24V
7 NC
8 NC
M1
READER MOTOR

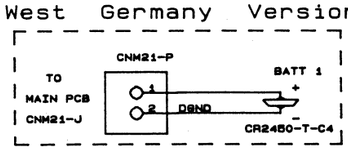

TO
MAIN PCB
CNM4-J
1
2
3
4
5 +24V
6 +24V
M2
PRINTER MOTOR

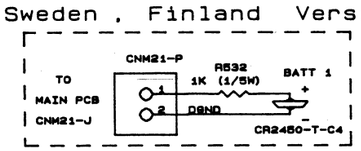

Sweden , Finland Version
PCB13 MODULAR PCB
CNJ1
TO
MAIN PCB
CNM11-J
1
2
3
4
L101
L102
MJ1
LINE
/TEL

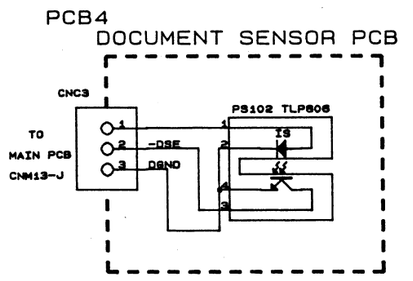

PCB3 CONTROL PCB
CNC1-J
TO
MAIN PCB
CNM15-J
1 NC
2 NC
3 NC
4 -LED4
5 -LED3
6 -LED2
7 -LED1
8 -LED0
9 +5V
10 -STA
11 -VOB
12 -HOD
13 DGND
NORM/AUTO
FINE/MANU
ALARM
TALK
START/STOP
D102
D103
D101
D105
D106
START/STOP
TALK
MODE
SW103
SW102
SW101
NOTE
G: GREEN LED
R: RED LED
A: AMBER LED

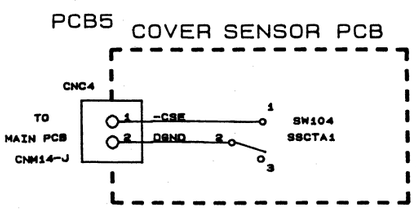

PCB6 PAPER END SENSOR PCB
CNC2-J
TO
MAIN PCB
CNM12-J
1 +5V
2 PVC
3 -PSE
4 DGND
R101
180 (1/5W)
VR101
500 (B)
R102
43K
(1/5W)
PS101
ON2153 (CA)
Q102
C2021Q (R)
Q101
C2021Q (R)


West Germany Version
TAE S6N
CONNECTOR
MODULAR
PLUG
TO
MAIN PCB
CNM11-J
1
2
3
4
5 NC
6
CNM11-P
E
b2
a2
L1


West Germany Version
CNM21-P
TO
MAIN PCB
CNM21-J
1
2 DGND
BATT 1
+
-
CR2450-T-C4

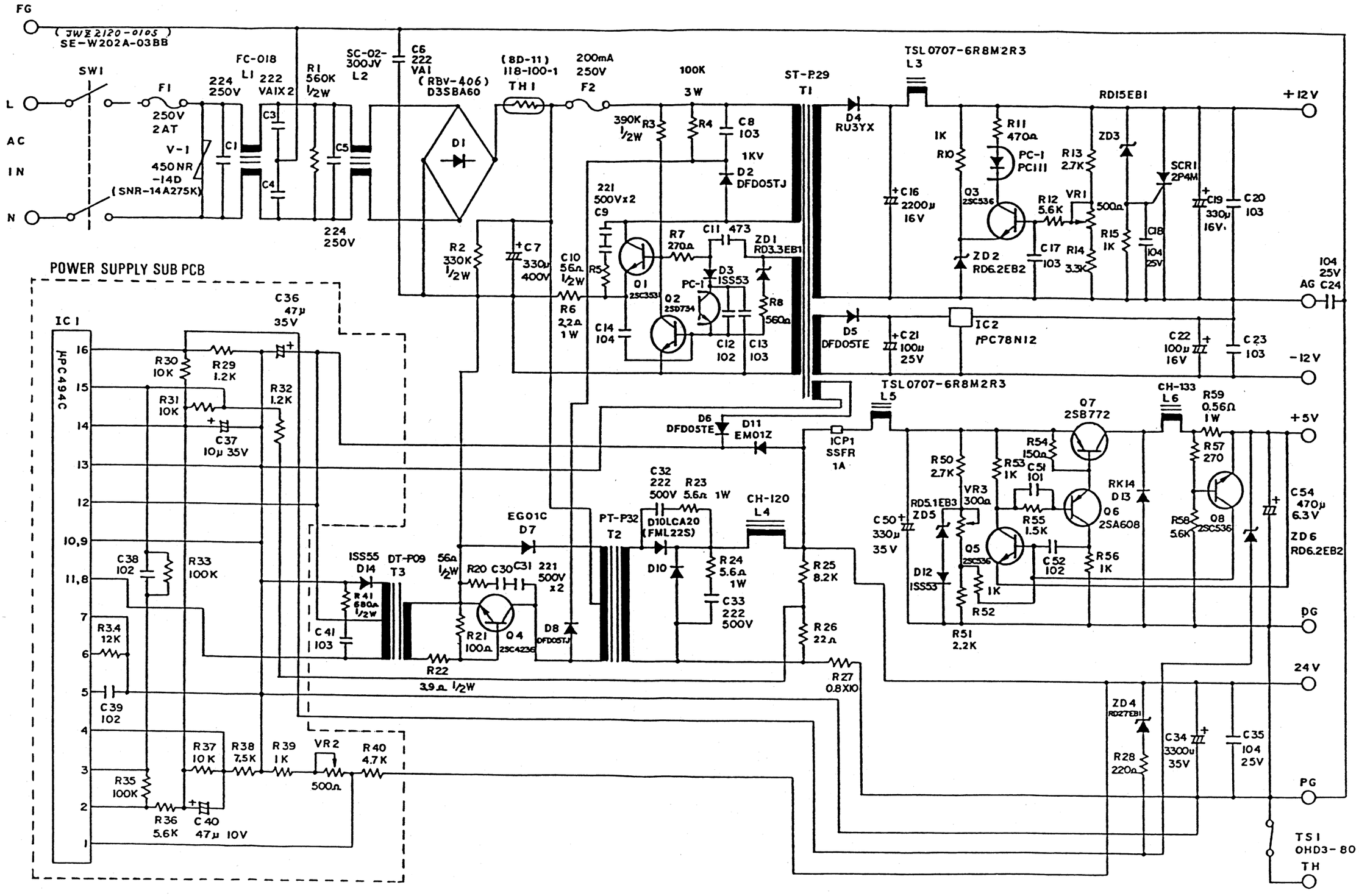

Sweden , Finland Version
CNM21-P
TO
MAIN PCB
CNM21-J
1
2 DGND
R532
1K (1/5W)
BATT 1
+
-
CR2450-T-C4


PCB4
DOCUMENT SENSOR PCB
CNC3
TO
MAIN PCB
CNM13-J
1
2 -PSE
3 DGND
PS102 TLP806


PCB5 COVER SENSOR PCB
CNC4
TO
MAIN PCB
CNM14-J
1 -CSE
2 DGND
SW104
SSCTA1

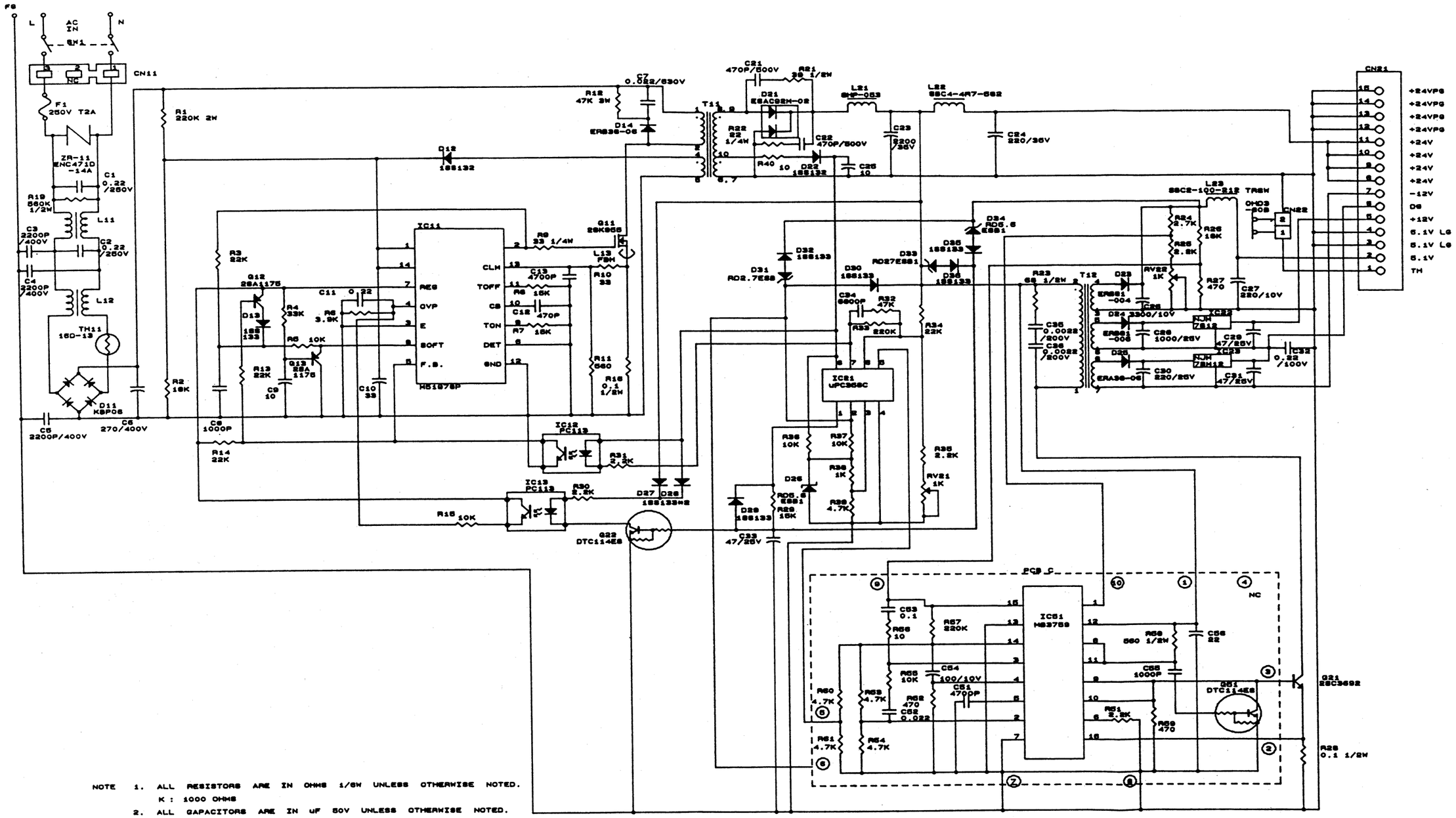
4. POWER SUPPLY UNIT

220V/1812470



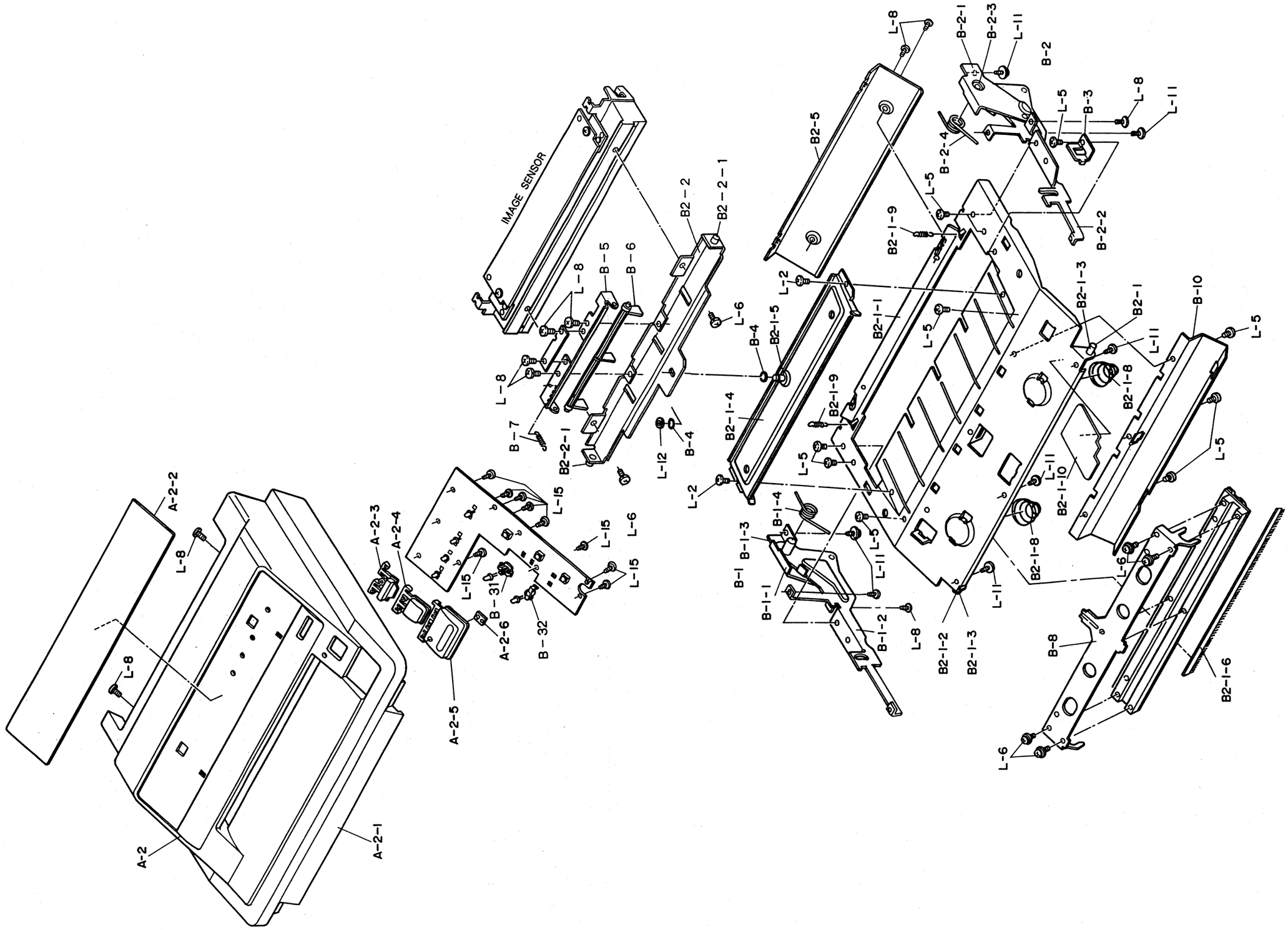
4. POWER SUPPLY UNIT

220V/1813124

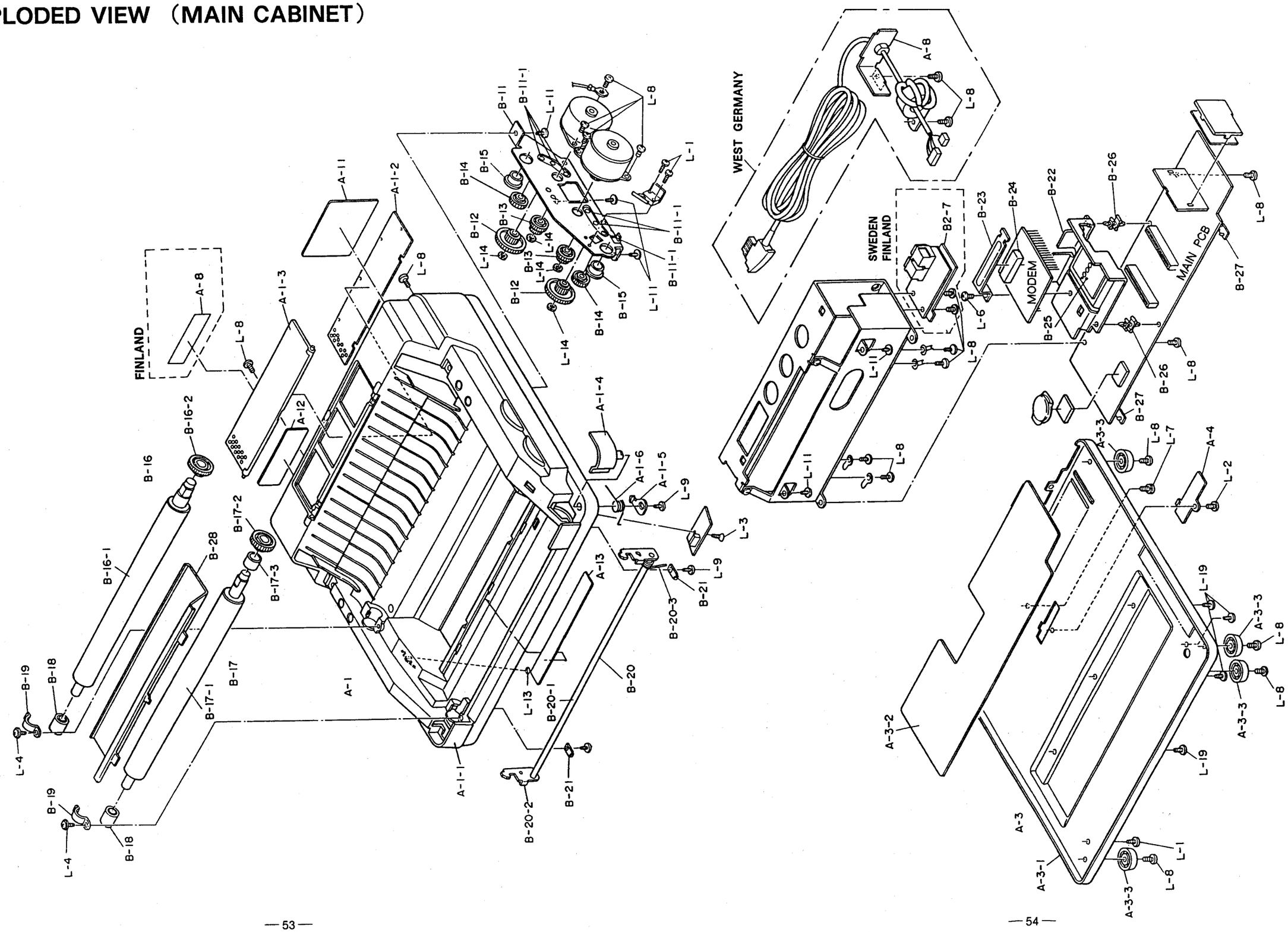


NOTE 1. ALL RESISTORS ARE IN OHMS 1/6W UNLESS OTHERWISE NOTED.
K : 1000 OHMS
2. ALL CAPACITORS ARE IN uF 50V UNLESS OTHERWISE NOTED.
P : uuF

EXPLODED VIEW (TOP CABINET)



EXPLODED VIEW （MAIN CABINET）



MECHANICAL PARTS LIST

Ref.No.	Description	Part No.
A – 1	**MAIN CABINET ASS'Y**	E,S : 8A00390X V : 8A00435X
	– – – CONSIST OF FOLLOWING ; – – –	
	(A – 1 – 1) MAIN CABINET	E,S : 8C00248 V : 8D00295
	(A – 1 – 2) CABINET COVER CABINET COVER (V)	E,S : 8S00650 V : 8H00122
	(A – 1 – 3) PAPER SUPPORTER	8D00289
	(A – 1 – 4) OPEN KNOB	8D00298
	(A – 1 – 5) OPEN KNOB HOLDER	8S00652
	(A – 1 – 6) KNOB SPRING	8V00075
	(A – 11) TYPE LABEL	E,S : 8E01148 V : 8P00422
	(A – 12) CAUTION LABEL	8E01013
	(A – 13) INFORMATION LABEL	8E00746
	(B – 27) PCB HINGE	8N00178
	(B – 28) PAPER HOLDER	8S00562
A – 2	**TOP CABINET ASS'Y**	8A00419X
	– – – CONSIST OF FOLLOWING – – –	
	(A – 2 – 1) TOP CABINET	8C00220
	(A – 2 – 2) DISPLAY PANEL	8E01035
	(A – 2 – 3) MODE BUTTON	8D00273
	(A – 2 – 4) TALK BUTTOM	8D00281
	(A – 2 – 5) START /STOP BUTTON	8D00286
	(A – 2 – 6) LED LENS	8N00200
A – 3	**BOTTOM CHASSIS ASS'Y**	8A00370X
	– – – CONSIST OF FOLLOWING – – –	
	(A – 3 – 1) BOTTOM CHASSIS	8G00209
	(A – 3 – 2) INSULATING SHEET (A)	8P00280
	(A – 3 – 3) RUBBER FOOT	8N00179
	(L – 8) SCREW, S – TIGHT, BIND HEAD M3 × 5	GBMS305
A – 4	SWITCH COVER	8H00102

Ref.No.	Description	Part No.
A – 8	CAUTION LABEL (E)	E : 8P00466
A – 8	BUSH PLATE	V : 8S00791
B – 1	**HINGE BRACKET (L) ASS'Y**	8A00333X
	– – – CONSIST OF FOLLOWING ; – – –	
	(B – 1 – 1) HINGE BARCKET (L)	8S00641
	(B – 1 – 2) HINGE ARM (L)	8S00639
	(B – 1 – 3) HINGE SHAFT	8U00219
	(B – 1 – 4) HINGE SPRING (L)	8V00072
B – 2	**HINGE BACKET (R) ASS'Y**	8A00334X
	– – – CONSIST OF FOLLOWING ; – – –	
	(B – 2 – 1) HINGE BARCKET (R)	8S00640
	(B – 2 – 2) HINGE ARM (R)	8S00638
	(B – 2 – 3) HINGE SHAFT	8U00219
	(B – 2 – 4) HINGE SPRING (R)	8V00071
B – 3	SENSOR STOPPER	8S00708
B – 4	O – RING	8N00228
B – 5	DOCUMENT SENSOR BARCKET	8S00551
B – 6	SHUTTER (FOR DOCUMENT SENSOR)	8N00172
B – 7	STRAIN SPRING	8V00060
B – 8	THERMAL HEAD BRACKET	8S00673
B – 10	ROLL PAPER GUIDE	8S00648
B – 20	**LOCK LEVER SHAFT ASS'Y**	8A00329X
	– – – CONSIST OF FOLLOWING ; – – –	
	(B – 20 – 1) LOCK LEVER SHAFT	8U00215
	(B – 20 – 2) LOCK LEVER	8S00646
	(B – 20 – 3) LOCK LEVER SPRING	8V00074
B – 21	SHAFT STOPPER	8H00100
B – 22	HEAT SINK	8S00710
B – 23	PCB HOLDER	8S00709
B – 24	GUM SPACER	8P00387

Note : V···W.Germany, S···Sweden, E···Finland

Ref.No.	Description	Part No.
B – 25	SILICON GUM	8N00955
B – 26	PCB SUPPORTER	8N00217
B – 29	PCB SPACER	8P00398
B – 30	ROM LABEL	8P00350
B – 31	LED HOLDER (B)	8N00201
B – 32	LED HOLDER (C)	8N00202
B2 – 1	**UPPER CHASSIS ASS'Y**	8A00374X
	– – – CONSIST OF FOLLOWING ; – – –	
	(B2 – 1 – 1) UPPER CHASSIS	8R00321
	(B2 – 1 – 2) LOCK PIN	8U00217
	(B2 – 1 – 3) LOCK ROLLER	8U00216
	(B2 – 1 – 4) DOCUMENT INLET CHASSIS	8S00672
	(B2 – 1 – 5) GUIDE SHAFT	8U00221
	(B2 – 1 – 6) STATIC KILLER BRUSH	8A00319
	(B2 – 1 – 7) STATIC KILLER BRUSH	8A00408
	(B2 – 1 – 8) HEAD SPRING	8V00067
	(B2 – 1 – 9) SENSOR SPRING	8V00082
	(B2 – 1 – 10) INSULATING SHEET (C)	8P00419
	(L – 16) SCREW, S – TIGHT BIND HEAD M2.6 × 4 (BLACK)	GBKS904
B2 – 2	**DOCUMENT INLET GUIDE ASS'Y**	8P00370X
	– – – CONSIST OF FOLLOWING ; – – –	
	(B2 – 2 – 1) SENSOR PIN	8U00218
B2 – 3	SENSOR BRACKET (L)	8S00701
B2 – 4	SENSOR BRACKET (R)	8S00700
B2 – 5	DOCUMENT EXIT GUIDE OUT (1)	8S00666
B2 – 6	DOCUMENT GUIDE CHASSIS OUT (2)	8S00702
B2 – 7	INSULATING SHEET (M)	E,S 8P00364
L – 1	SCREW, SEMES, PAN HEAD M2 × 8	CPM3908
L – 2	SCREW, S – TIGHT, BIND HEAD M2.6 × 4	GBKS904
L – 3	SCREW, P – TIGHT, FLAT HEAD M2.6 × 8	GBMP908
L – 4	SCREW, P – TIGHT, BIND HEAD M2.6 × 8	GBMP908

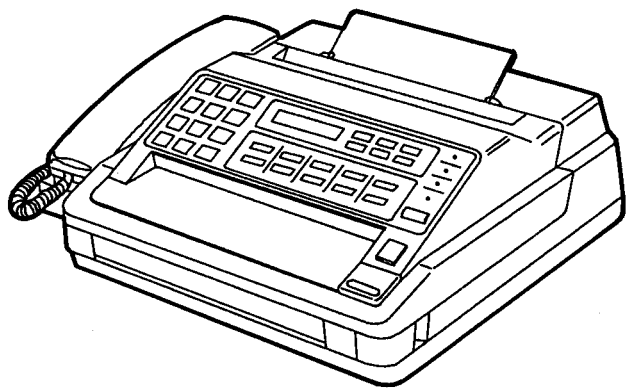
Ref.No.	Description	Part No.
L – 5	SCREW, S – TIGHT, BIND HEAD M3 × 4	GBMS304
L – 6	SCREW, SEMS, PAN HEAD M3 × 6	CPM3306
L – 7	SCREW, S – TIGHT, BIND HEAD EARTH M3 × 8	SZK3308
L – 8	SCREW, S – TIGHT, BIND HEAD M3 × 6	GBMS306
L – 9	SCREW, P – TIGHT, BIND HEAD M3 × 6	GBMP306
L – 11	SCREW, P – TIGHT, BIND HEAD M3 × 8	GBMP308
L – 12	E – RING SIZE 4	EEU0040
L – 13	CS WASHER SIZE 2	WTK2202
L – 15	SCREW, P – TIGHT, BIND HEAD M2 × 5	GBMP205
L – 19	SCREW, B – TIGHT, BIND HEAD M3 × 8	GBKB308
L – 20	SCREW, S – TIGHT, FRANGE HEAD M3 × 8	GFMS308

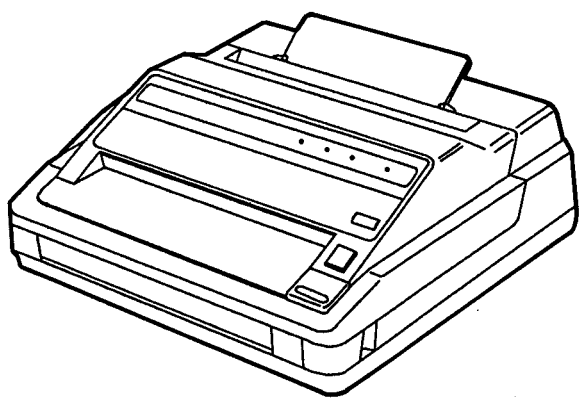
Note : V···W.Germany, S···Sweden, E···Finland

FUNAI

SERVICE MANUAL

PERSONAL FACSIMILE AND COPIER





COMMON SERVICE MANUAL

Please use this COMMON SERVICE MANUAL for the FA-X10/20, FA-X11/21, PFX5800/6800/7800 series, and use it together with the SERVICE MANUAL for the individual model.

Please read before servicing equipment

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2. INSTALLATION PRE-CAUTIONS

1) Do not use in direct sunlight or in locations where dust accumulates (near air-conditioning outlet, etc.).
2) Avoid extremes of temperature and humidity.
   temperature ; 5°C~35°C, humidity: 45%~85%.
3) Do not operate the unit on the same power line as equipment with an irregular current flow, e.g. motors in airconditioners, typewriters, copiers, etc.
4) Installing near by the T.V. Radio may occur interference. About 3 meters clearance are recommended.
5) Be sure to connect the ground for safety.
   Caution: Never connect to gas or water piping.

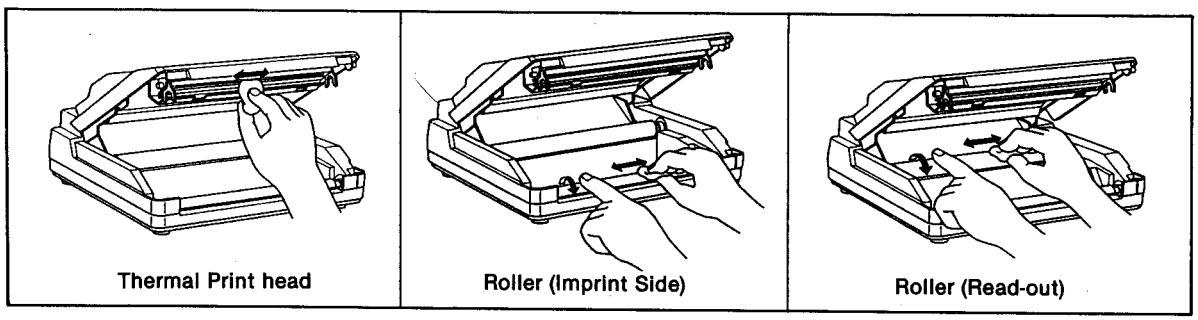
3. MAINTENANCE

1) CLEANING

Preventative maintenance is a good habit to get into. This apparatus has been engineered to be exceptionally reliable. The simple steps outlined below, performed after every 6 rolls of paper use, will keep this apparatus operating like new.

CLEANING OF THERMAL PRINT HEAD AND PAPER GUIDE ROLLERS.

Thermal print head, paper guide rollers should be cleaned softly with a cotton swab or non-static soft cloth moistened with pure isopropyl al cohol.



2) THERMAL PAPER ROLL

- Store the recording paper in dry, cool and dark place to avoid high temperature, high humidity and direct sunlight.
- In case of storing the recording paper, do not open the packing paper of recoding paper.
- Use only specified recording paper to obtain clear picture image.

Specified. Recoding Paper: # 9B00001
Thermal paper
216mm (W) x 30m (L)
Max. diameter: 62mm (8.5" x 98')

1. GENERAL SPECIFICATIONS

Model No.: PFX5800/PFX6800/PFX7800/FA-X11/FA-X21/FA-X10/FA-X20

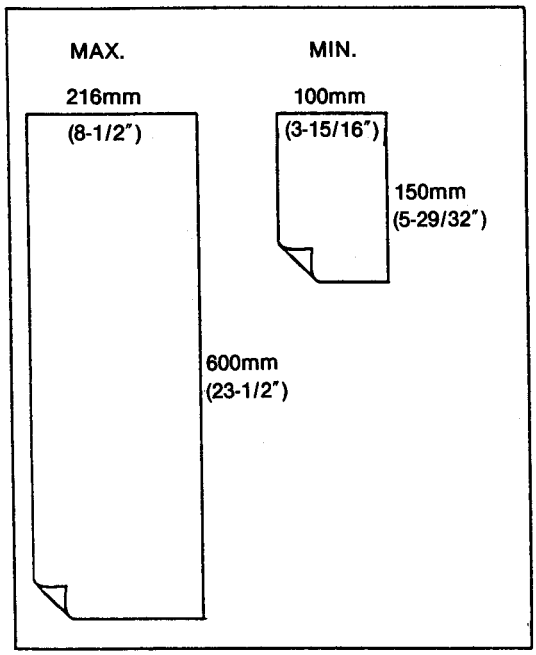
Items	Descriptions
Line connection	PSTN (Public Switched Telephone Network)
Compatibility	CCITT G3/G2
Communication system	Half-duplex
Transmission speed	*25sec aprox. (G3, Normal mode 9600 BPS)
Modem	9600/7200/4800/2400BPS Automatic shiftdown
Coding	MH
Resolution	G3: (H) 8 pels/mm (V) Normal 3.85 lines/mm Fine 7.7 lines/mm
	G2: (H) 8 pels/mm (V) 3.85 lines/mm
Scanning Method	Contact image sensor
Printing Method	Thermal transfer
Document size (W × L)	216mm × 600mm max. 100mm × 150mm min.
Thermal paper roll (W × L)	216mm × 30m
Effective scan width	205mm
Effective print width	208mm
Talk request	Yes
Local copy	Yes
Auto Document Feeder	No
Auto Paper Cutter	No
Page number print	Yes
Contrast	Automatic
Manual/Auto receive	Yes
Power supply	AC 220−240V, 50Hz (EUROPE) AC 100−120V, 60Hz (USA, JAPAN)
Power Consumption	Stand by: 15 Watts Operating: 130 Watts max.
Size (W × D × H)	310mm × 278mm × 107mm
Weight	4.7Kg
Operating environment	Temperature +5~+35°C Humidity 35%~85% RH

*__Transmission speed:__ With a Funai standard document without time for protocol signal i.e., CCITT phase C time only.

Model No.: PFX6800/PFX7800/FA-X21/FA-X20

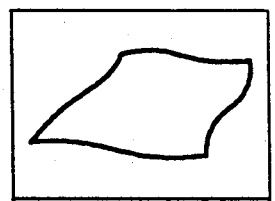
Item	Description
Halftone	Yes, 16 levels
LCD display	16 digits, 1 line
One touch dialing	10 locations (32 digits)
Abbreviated dialing	50 locations (16 digits)
Redial	Yes
Journal print	Yes (40 reports max.)
Transmit Terminal ID	Yes (20 digits)
Clock & calendar	Yes

3) DOCUMENT CONDITIONS

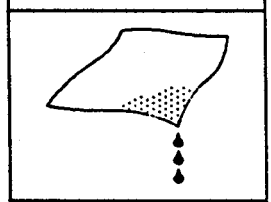


This Facsimile machine will not operate correctly if the condition of the document to be copied or transmitted falls into any of the following categories:

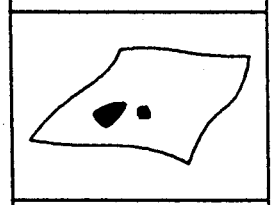
* Cloth



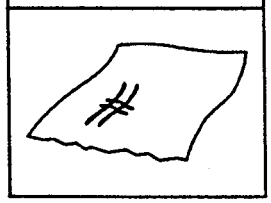
* Wet or damp paper



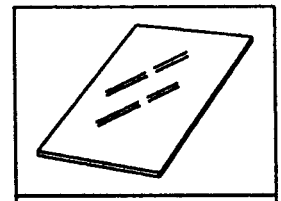
* Ink or glue have not yet dried



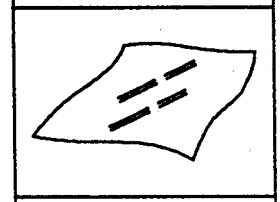
* Paper worn out



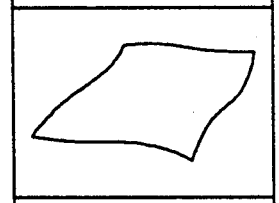
* Metal sheet



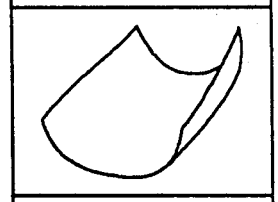
* Laminate paper



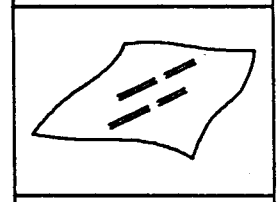
* Printing paper



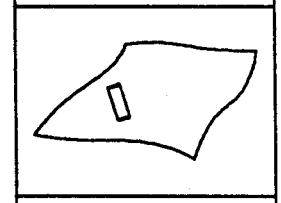
* Curled paper



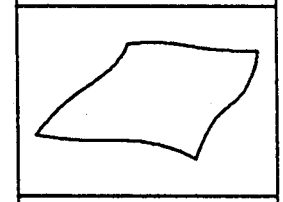
* Surface is too smooth



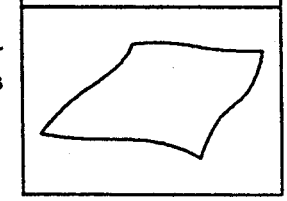
* Any plastic tape on the paper



* Carbon paper



* Improper thickness (over 0.15mm or less than 0.05mm)



4. THEORY OF OPERATION

OUTLINE

This device, if divided into blocks according to functions, can be classified into the nine blocks below.

① MAIN MPU BLOCK

This block is composed of the main MPU (IC1), the PROM (IC5), and the RAM (IC6). The main control block regulates, directly or indirectly, the interface block, the modem block, the one-chip MPU block, the recording block, the read-out block, etc.

② INTERFACE BLOCK

This block is composed of custom gate array ICs (IC9 and IC11). The interface block is controlled by the main MPU; it functions as a relay unit to send command signals to the peripheral circuits, and to relay signals from the peripheral circuits to the main MPU.

③ ONE-CHIP MPU BLOCK

This block is composed of the one-chip MPU (IC2). The one-chip MPU controls the read-out sensor, the thermal-imprint head, the drive motors (M1 and M2), etc.

④ RECORDING BLOCK

This block is composed of the thermal-imprint head (UN4), a drive motor (M2), the motor driver IC (IC4), the thermal paper roll, and the sensor (PS101).
The recording block functions, by means of the thermal-imprint head, to imprint the image signals (sent by way of the interface block) onto the thermal paper.

⑤ READ-OUT BLOCK

This block is composed of the contact-image sensor (UN3), a drive motor (M1), the motor-drive IC (IC3), and the doument sensor (PS102); it functions to send to the main control block, by way of the interface block, image data read out by the contact-image sensor.

⑥ OPERATION BLOCK

This block is composed of the buttons on the upper cabinet. These buttons are used by the operator.

⑦ MODEM BLOCK

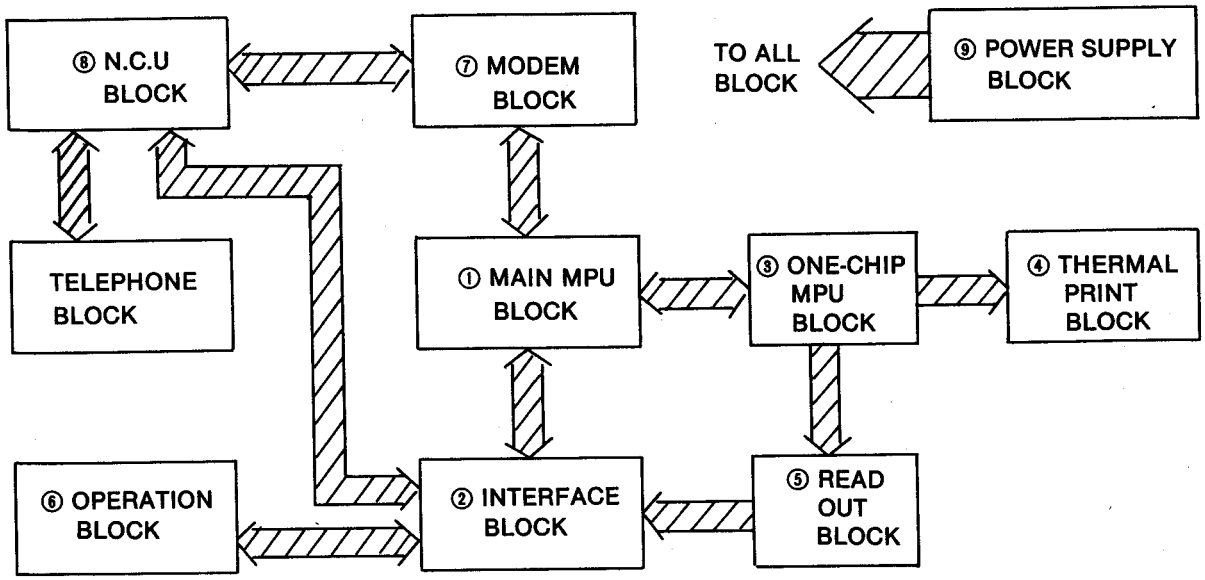
The modem unit (UN2) conforms to the communication conditions prescribed in CCITT V29, V27 ter, T30, T4 and T3. The modem functions to modulate the data sent from the main MPU, and to transmit, via a telephone line, to the corresponding device. In addition, it demodulates data sent from the corresponding device, and transfers those data to the main MPU.

⑧ NCU (NETWORK CONTROL UNIT) BLOCK

The NCU block is composed of relays, the loop current-detection circuit, the ringer-signal-detection circuit, and the dial-signal-generation circuit (built-in telephone or external telephone). The NCU functions as the interface between the telephone line and the device, and also functions to control the telephone line side according to directions from the main MPU.

⑨ POWER-SUPPLY BLOCK

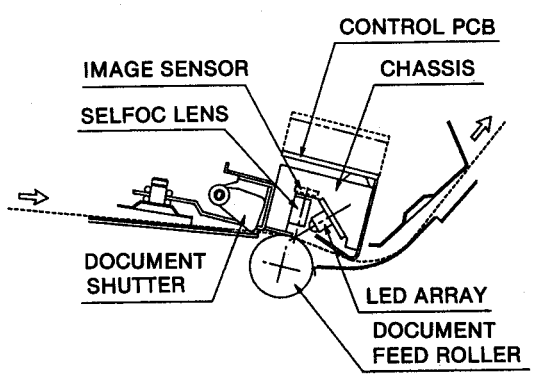
The power-supply block is composed of the power PCB, the power-inlet jack, and the power switch; it is unified by the shielded chassis (UN1). The power-supply unit functions to supply stabilized DC voltages (+5V, +12V, -12V and +24V) to each block of the device by AC 100 -120V, 60Hz (USA and Japan) or AC 220 -240V, 50Hz (Europe).



1) READ OUT SECTION

A contact image sensor is used as the optical system; the sensor section, amplifier, A/D conversion circuitry, image-processing circuitry, etc. are unified as a module. For activation, the binary-converted serial data ($\overline{VSDA}$) are synchronized to the clock pulse ($\overline{VSCK}$), by the clock pulse ($\overline{CK8V}$) and power supply, and are output.
The output data are input from the $\overline{VSDA}$ terminal of IC9, and, when the internal serial-to-parallel conversion occurs, the data are read into the picture-image buffer as 8-bit data while at the same time there is a count check of each line (1, 728). The control of the tone-shading mode level setting and distortion-correction start is performed by the one-chip MPU (IC2).

READ OUT MECHANISM CONSTRUCTION



Tone-shading setting table

MDS3	MDS2	MDS1	Operation mode
L	L	H	Binary level 0
H	L	H	Binary level 1
L	L	L	Binary level 2
H	L	L	Binary level 3
L	H	L	Binary level 4
H	H	L	Binary level 5
L	H	H	Dither (normal)
H	H	H	Dither (sharp)

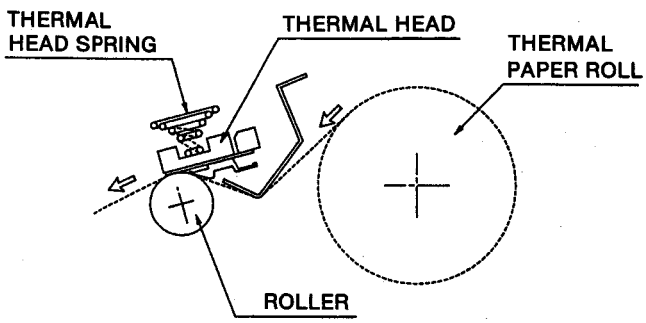
Light ↕ Dark

(Automatically set by one-chip MPU.)

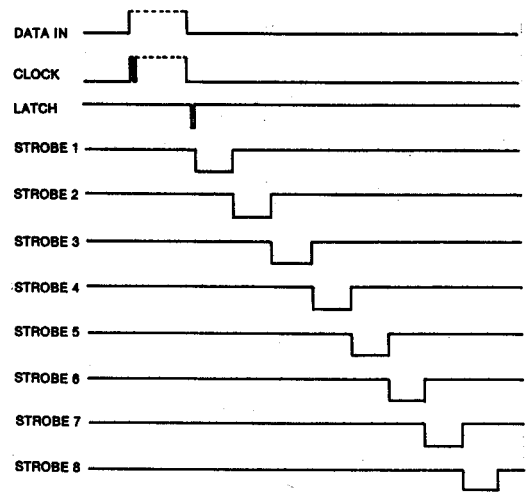
2) MECHANISM AND IMPRINT CONTROL SECTION

This circuitry is mainly composed of IC2 (one-chip MPU) and IC9 (gate array).
This one-chip MPU is a complete slave to the main MPU; it accepts commands from the main MPU transmitted by serial transmission, and executes the operations for those commands. If the operations for the commands are completely executed, the $\overline{\text{SUBACK}}$ signal is the response to the MPU; if for any reason the operations for the commands cannot be completely executed, the $\overline{\text{NAK}}$ signal (via IC9) is the response to the MPU. For control of the mechanism section, the reader side stepping motor and the printer side stepping motor are controlled, by way of the motor drivers (IC3 and IC4), so that document insertion and transport, recording paper transport, paper feed, etc. are performed.
The stepping motors used (at the both the reader side and the printer side) are 4-phase stepping motors. These motors are directly controlled (from the output port of the one-chip MPU) by the two-phase excitation method. For control of imprinting, almost all signals output to the thermal head are controlled; the image-signal data within the picture-image buffer are transferred at high speed from the SIN terminal of IC9 to the shift register within the thermal head, and, at the moment when the 1, 728-dot data are sent, the command is provided to the one-chip MPU from the main MPU, after which the one-chip MPU provides the STROBE signals to the thermal head, and the impression is made. In order to prevent dispersion of the density of the impression resulting from the temperature of the thermal head, IMPRINTING PERIOD, Resistance value of thermal head, the number of impression dots, etc., these parameters are input to the one-chip MPU so that the pulse-width of the STROBE signals is varied by the appropriate algorithm, thereby controlling the impression density.

IMPRINT MECHANISM CONSTRUCTION



Thermal head STROBE timing



3) MODEM SECTION

The functions described above are controlled by accessing of the interface registers (located within the modem) by the MPU (on the printed-circuit board) by way of the data bus. The principal items regulated by these registers are as described below.

Mode settings: V29, V27 ter, G2, FSK, tone transmission and reception. Equalizer's equalization system, carrier detection threshold, echo suppressor protect
Tone addition, transmission/reception mode setting, G2 AGC control, tone frequency setting

As a result of the reading of data from the registers by way of the data bus, the modem conditions (tone detection, training pattern detection, etc.) are monitored. For transmission, data transmitted from the CPU are assigned and modulated, and these are then provided from the transmission analog output to the NCU section. For reception, the reception analog signals provided from the NCU section pass through the filter circuit; then, after being demodulated at the modem, they are read in to the MPU.

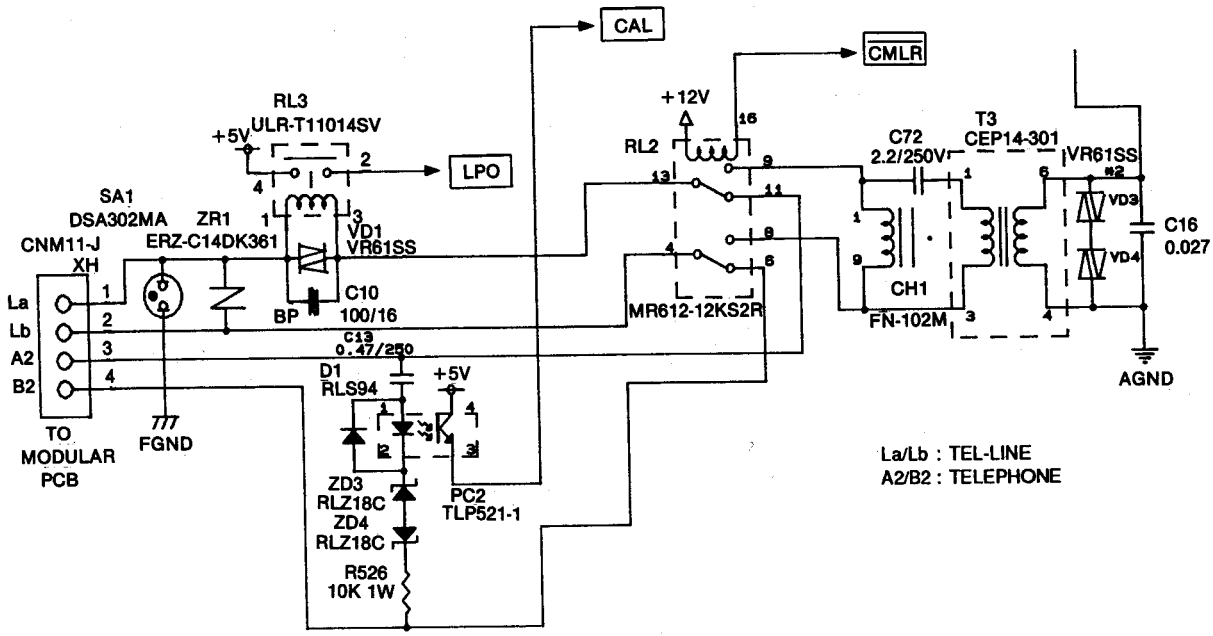
This modem has the modulation/demodulation functions described below.

Transmission mode	Transmission speed	Modulation system	Modulation speed	Carrier frequency	CCITT recommendation
G3	9600BPS	Hexadecimal QAM	2400baud	1700Hz	V29
G3	7200BPS	Octal QAM	2400band	1700Hz	V29
G3	4800BPS	8-phase PSK	1600baud	1800Hz	V27ter
G3	2400BPS	4-phase PSK	1200baud	1800Hz	V27ter
G3	300BPS	FSK	300baud	1650/1850Hz	V21
G2		AM•PM-VSB		2100Hz	T3

Tone transmission and detection

Signal designation	Frequency
CED	2100Hz
GI	1850Hz
GC	2100Hz
CFR	1650Hz
MCF	1650Hz
LCS	1100Hz
EOM	1100Hz
PIS	462Hz

4) NCU CIRCUIT (Network Control Unit)



4-1) DC circuit

The DC resistance of transformer and the DC resistance of the off-hook detection circuit (DC circuit) is designed in accordance with PTT requirements; in addition, the nominal impedance is 600 ohms at 0.3 - 4kHz.

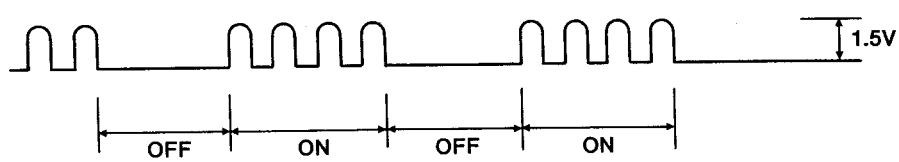
4-2) Off-hook detection circuit

The off-hook detection circuit is composed of lead relay RL3 (in series with telephone receiver) as well as C10 and VD1. When there is a off-hook, A2 and B2 are connected, and there is detection as a result of the flow of direct current to the coil part of the lead relay, thus switching the relay ON. C10 is inserted in order to suppress momentary pauses and momentary power interruptions during telephone use.

4-3) Ring detection circuit

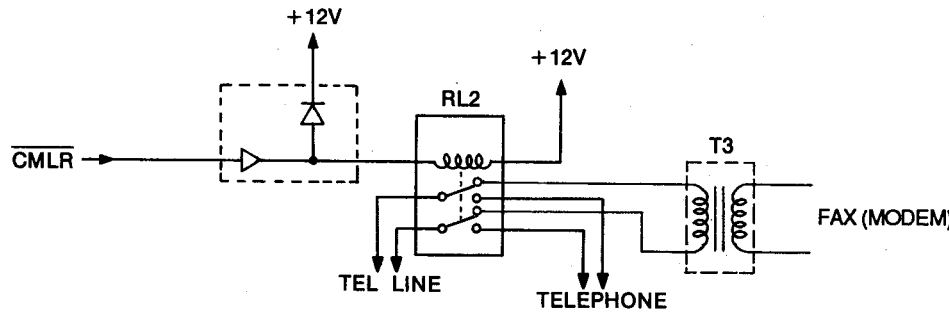
The ring detection circuit is composed of C13 as well as D1, ZD3, and PC2 (all in parallel with the telephone circuit); when the ring signal (15 - 58Hz) is input, the direct-current component (DC 55 - 60V) is suppressed by C13, with the result that only the AC component is subjected to half-wave rectification by D1. After that, photo-coupler PC2 is switched ON, and the frequency is selected by the MPU in relation to the output signal. The ZD3 zener diode is for elimination of noise.

Ring signal (PC2 1 pin-2 pin)



4-4) CML circuit

When there has been an automatic reception response or the facsimile button has been pressed, RL2 (Relay) is activated by the $\overline{\text{CMLR}}$ signal "ON" (0V) from IC9, thus closing and connecting the DC loop. As a result, the telephone line is switched to the facsimile side (modem).



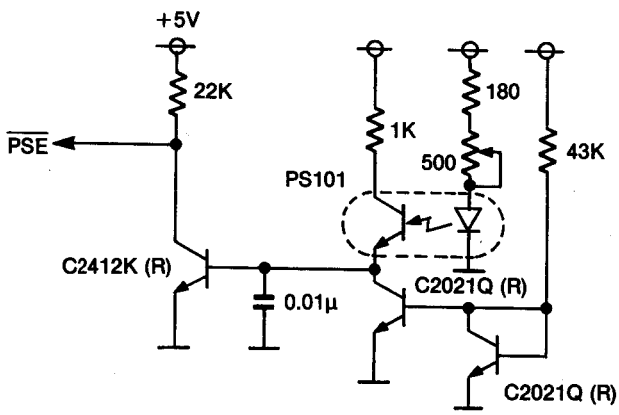
4-5) Surge absorbers

The surge absorbers are provided in order to prevent damage to the NCU circuit section as a result of surge voltage produced between telephone lines; SA1 is used between La and ground, and ZR1 is used between La and Lb.

5) SENSOR CIRCUITS

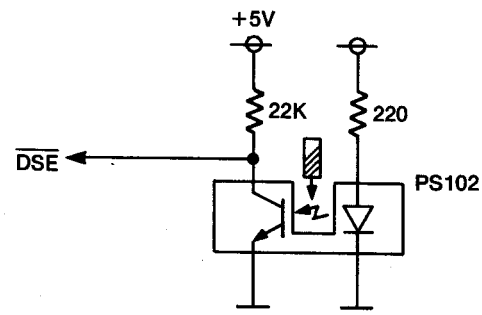
5-1) Paper-end sensor circuit

A reflection-type photo-sensor is employed for detection of the paper end; when there is detection of the paper black band (paper-end marking), or there is no recording paper, the photo-sensor (PS101) is switched OFF, and $\overline{\text{PSE}}$ of IC9 changes from 0V to 5V, thus resulting in the detection.



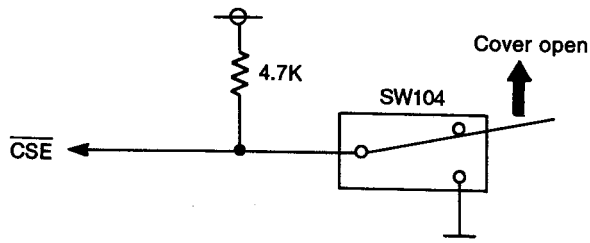
5-2) Document sensor circuit

A photo-interruptor is employed for detection of the document; when the document is inserted, the photo-interruptor (PS102) is switched OFF; and DSE of IC9 changes from 0.13V to 5V, thus resulting in the detection.



5-3) Cover sensor circuit

A microswitch is employed for detection of the opening of the cover; when the cover is opened, the microswitch (SW104) is switched OFF, and the detection is made as the result of the change (from 0V to 5V) of the CSE of IC9.



6) POWER-SUPPLY UNIT

This power-supply unit has an input voltage of AC 85 - 138V (USA, JAPAN) or AC 198 - 264V (Europe), and five outputs: +24V (1.52A), +5V (1.0A), +12V (0.8A), -12V (0.09A), and TH (thermal switch terminal). The TH (thermal switch terminal) is usually ON (GND); when, however, the temperature of the unit rises to approximately 80°C, TH is switched OFF (OPEN), and the unit's temperature status is detected by the MPU.

Connector connections

Pin no.	Terminal designation
1	TH
2	+5V
3	DGND
4	DGND
5	−12V
6	AGND
7	+12V
8	+24V
9	+24V
10	+24V
11	+24V
12	PGND
13	PGND
14	PGND
15	PGND

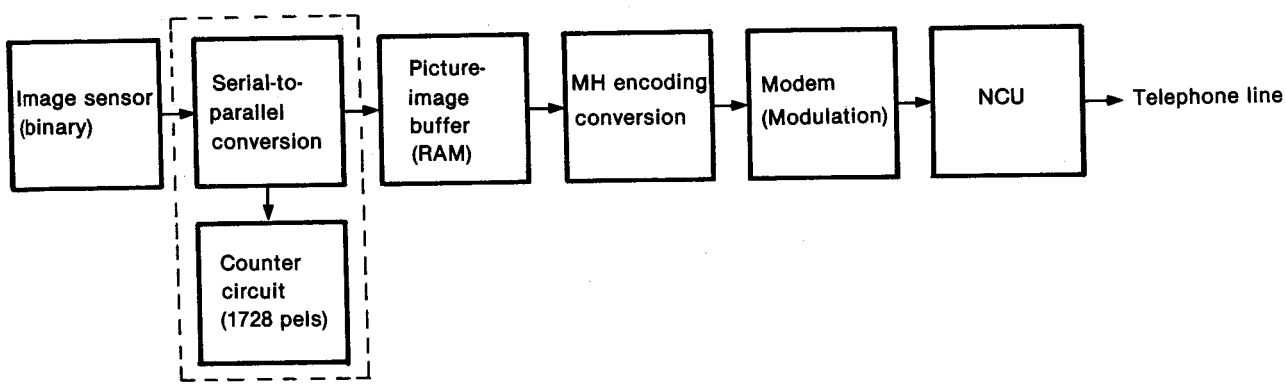
This power-supply unit incorporates an overcurrent protection circuit; if the rated output current is exceeded and the activation current value is reached, the output is caused to drop.

Overcurrent protection circuit activation current values

Output	Protection circuit activation current
+5V	1.2A or higher
+24V	7.6A or higher (pulse load)
+12V	1.2A or higher
−12V	0.3A or higher

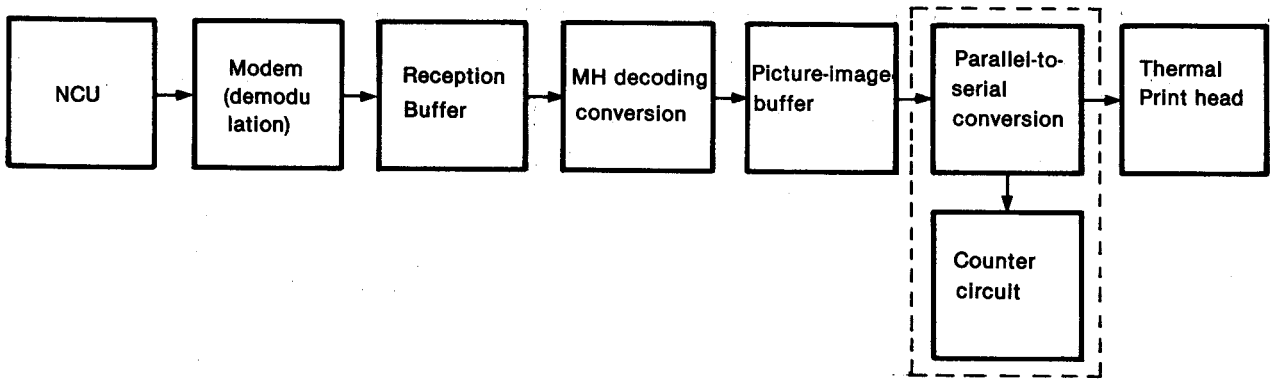
7) TRANSMISSION PROCEDURE

With the document inserted, if the "START" button depressed is recognized by the MPU (IC1) and at that time loop current is detected and LP0 of IC9 is HIGH level, the $\overline{\text{CMLR}}$ signal is generated from IC9 (gate array), the RL2 relay of the NCU circuit is switched ON, and the telephone line is connected with the facsimile (Modem). Since connection is established between apparatus operating in accordance with CCITT. Then, the MPU controls (through the modem) the command signals, and, when centering phase C (massage transmission) stage, the MPU, as a result of serial transmission of the TXS and CKS signals, activates IC2 (a one-chip MPU); after the subsequent read-out by the image sensor, the converted-to-binary read-out signals are subjected to serial-to-parallel conversion at IC9, after which the signals are input (by the DMAC within the MPU) to the RAM's picture-image buffer. The input picture signals are MH-encoded by the MPU, after which they are modulated by the modem and input to the telephone line (TXL). All scanning picture datas of the document for transmission are transmitted one after another in this same way. (See Figure-1)



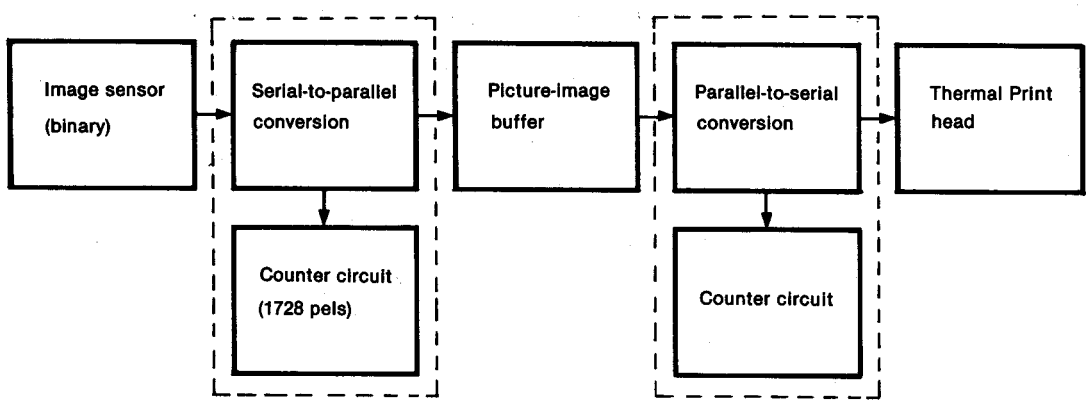
8) RECEPTION PROCEDURE

There are two methods of initiating the reception mode: manual and automatic. For either method, command signals are controlled by the MPU when the reception mode begins. When, thereafter, entering phase C (image reception) stage, the data from the modem are stored in the reception buffer (located within the RAM IC6). Thereafter, the data in the reception buffer are decoded (by MH decoder) and are reproduced on the picture-image buffer within the RAM (IC6). These reproduced signals are then subjected to parallel-to-serial conversion by IC9, and, after transfer to the thermal print head, they are imprinted upon thermal paper roll by the STROBE (1 - 8) signals controlled by IC2.



9) LOCAL COPYING PROCEDURE

When, with the document inserted, the START button depressed is recognized by the MPU, the MPU then issues commands for IC2 by serial START button depressed is recognized transmission of TXS and CKS signals, thus controls the image sensor and the motor, after which read-out is initiated. The read-out datas are then input to IC9 ($\overline{VSDA}$) as serial data. Simultaneous with the serial-to-parallel conversion within IC9, one line of read-out is completed at the moment when "1,728" is counted by the counter circuit. Subsequent read-outs are performed one after another, and the parallel-converted data are input as 8-bit data to the picture-image buffer (IC6). The data input to the picture-image buffer are then subsequentially subjected to parallel-to-serial conversion one after another by IC9 and output from SIN of IC9. When the START button depressed is then detected at the MPU, the $\overline{THMR}$ signal of IC9 is changed to LOW level, and when the PL1 relay is then switched ON, 24V is supplied to the thermal head power-supply terminal. The serial data output from IC9 are input to the thermal head, and , at the moment that the data corresponding to one line (1,728 dots) are input, that line is caused to be imprinted by the STROBE signals from the one-chip MPU. In this way, therefore, data from the picture-image buffer are line by line imprinted one after another.

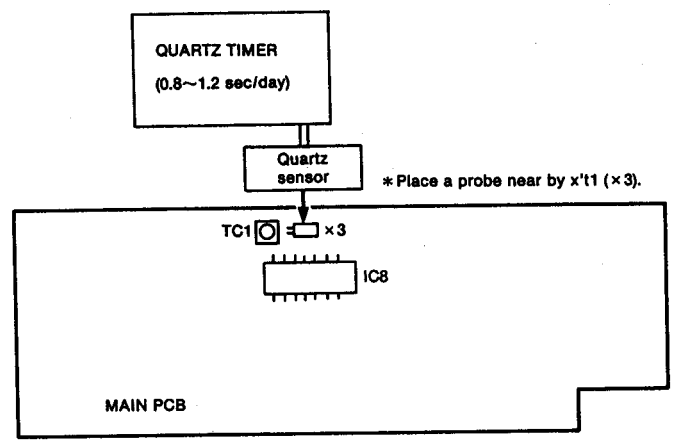


5. ALIGNMENT PROCEDURE

1) TIMER SETTING ADJUSTMENT

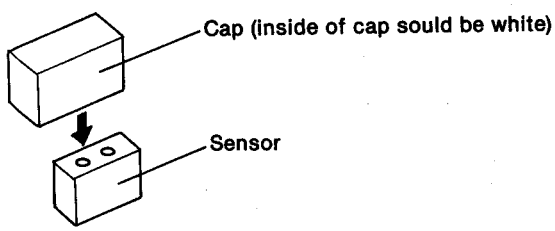
1-1) Contact the probe of quartz timer onto Main PCB as described.

1-2) Adjust TC1 to set 0.8~1.2 sec/day reading on quartz timer at 25°C.

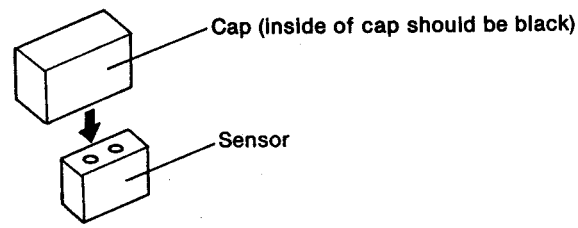


2) PAPER-END SENSOR ADJUSTMENT

2-1) Place a cap (White) on sensor-unit.



2-3) Place a cap (Black) on sensor unit and LED (B) light on.

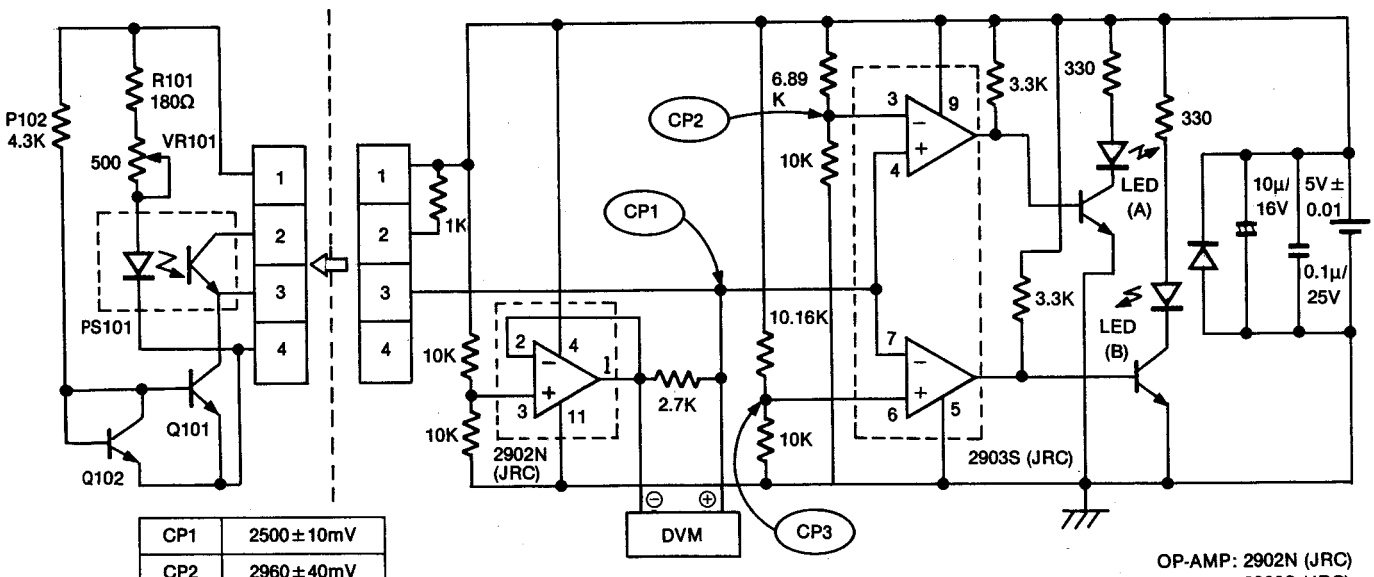


2-2) Adjust VR101 to set 520 ±20mV reading on DVM.
Confirm that LED (A) light on.

	LED (A)	LED (B)
White cap	Light on	Light off
Black cap	Light off	Light on

(PAPER-END SENSOR PCB)

(Fixture for ajdustment)



CP1	2500±10mV
CP2	2960±40mV
CP3	2480±5mV

*4 pin connector must be opened.

OP-AMP: 2902N (JRC)
2903S (JRC)

6. DIP-SWITCHES SETTING INSTRUCTIONS

1) DIP-SWITCHES LOCATIONS/DESCRIPTIONS

There are two kinds of main PCB as described below;

Type-A : Incorporated with Matsushita's Modem.

Type-B : Incorporated with Rockwell's Modem.

For setting switches properly, carefully check the below locations and descriptions instruction.

TYPE-A (WITH MATSUSHITA MODEM)

1. DS1 (Dip sw 1 : 4 bits)

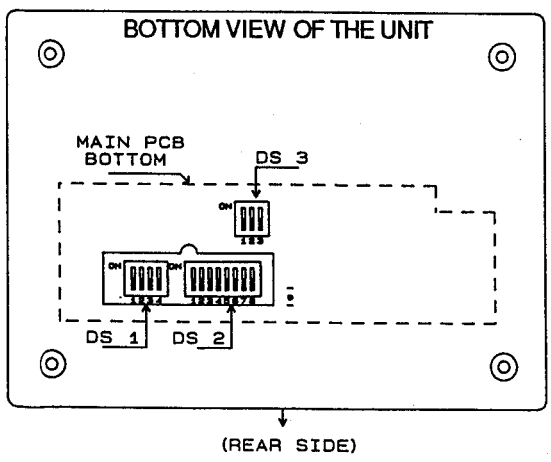
SW No.	Description of parameters	Setting OFF	Setting ON	Explanation
1	Transmit level attenuator	0dB	1dB	ON : Transmit level down 1dB
2	Transmit level attenuator	0dB	2dB	ON : Transmit level down 2dB
3	Transmit level attenuator	0dB	4dB	ON : Transmit level down 4dB
4	Transmit level attenuator	0dB	8dB	ON : Transmit level down 8dB

2. DS2 (Dip sw 2 : 8 bits)

SW No.	Description of parameters	Setting OFF	Setting ON	Explanation
1	Reception amplitude equalizer ---- 4dB	0dB	4dB	ON : Frequency response at 1.5k Hz will be amplified 4 dB.
2	Reception amplitude equalizer ---- 8dB	0dB	8dB	ON : Frequency response at 1.5k Hz will be amplified 8 dB.
3	Transmission amplitude equalizer ---- 8dB	0dB	8dB	ON : Frequency response at 1.5k Hz will be amplified 8 dB.
4	Communication speed 9600/4800 bps.	9600 bps	4800 bps	For manual selection of communication speed in case of bad connection of telephone line.
5	CED frequency setting 2100 Hz/1100 Hz.	2100 Hz	1100 Hz	Select CED frequency on receiving mode. Normally, set OFF position.
6	Test 1.	---	Test	Use for production test at factory.
7	Test 2.	---	Test	
8	Back up Batt. switch.	OFF	ON	Back up the memory of ID.

3. DS3 (Dip sw 3 : 3 bits)

SW No.	Description of parameters	Setting OFF	Setting ON	Explanation
1	Adjustment for thermal head.	---	---	Setting only at factory.
2	Adjustment for thermal head.	---	---	Setting only at factory.
3	Adjustment for thermal head.	---	---	Setting only at factory.



TYPE-B (WITH ROCKWELL MODEM)

1. DS1 (Dip sw 1 : 6 bits)

SW No.	Description of parameters	Setting OFF	Setting ON	Explanation
1	Back up Batt. switch.	OFF	ON	Back up the memory of ID.
2	Communication speed 9600/4800 bps.	9600 bps	4800 bps	For manual selection of communication speed in case of bad connection of telephone line.
3	Test 1.	---	Test	Use for production test at factory.
4	Test 2.	---	Test	
5	Cab. type selection	---	ON	Setting only at factory.
6	C.I.S. type selecton	OFF	---	Setting only a factoroy.

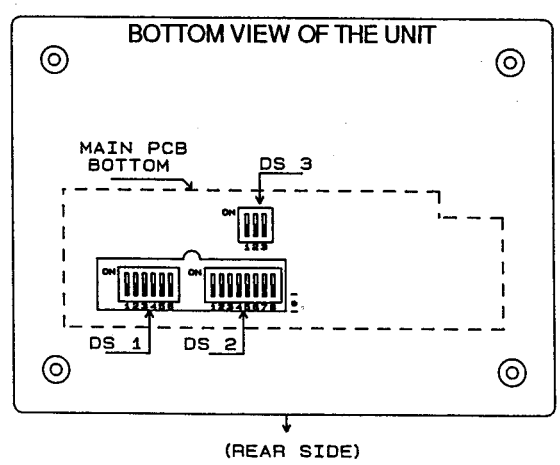
2. DS2 (Dip sw 2 : 8 bits)

SW No.	Description of parameters	Setting OFF	Setting ON	Explanation
1	Transmit level attenuator	0dB	0.25	ON : Transmit level down 0.25 dB
2	Transmit level attenuator	0dB	0.5	ON : Transmit level down 0.5 dB
3	Transmit level attenuator	0dB	1.0	ON : Transmit level down 1.0 dB
4	Transmit level attenuator	0dB	2.0	ON : Transmit level down 2.0 dB
5	Transmit level attenuator	0dB	4.0	ON : Transmit level down 4.0 dB
6	Transmit level attenuator	0dB	8.0	ON : Transmit level down 8.0 dB
7	Cable equalizer CABS 1			
8	Cable equalizer CABS 2			

CABS 2	CABS 1	φ0.4 Cable length
ON	ON	0.0 Km
ON	OFF	1.8 Km
OFF	ON	3.6 Km
OFF	OFF	7.2 Km

3. DS3 (Dip sw 3 : 3 bits)

SW No.	Description of parameters	Setting OFF	Setting ON	Explanation
1	Adjustment for thermal head.	---	---	Setting only at factory.
2	Adjustment for thermal head.	---	---	Setting only at factory.
3	Adjustment for thermal head.	---	---	Setting only at factory.



2) THERMAL PRINT HEAD ALIGNMENT

There are existing two type of Thermal head.

1) ROHM. type.
2) NEC. type.

When replace the thermal head, re-align the Dip-switch (DS3) as described below tables for each thermal heads. Either ROHM or NEC are indicated on every thermal head.

1) ROHM type

THERMAL HEAD RANK/DS3 SETTING TABLE

Rank No.	SW. 1	SW. 2	SW. 3	Thermal head resistance (ohms)
D	OFF	OFF	ON	1026~1105
E	ON	ON	OFF	986~1035
F	OFF	ON	OFF	946~ 995
G	ON	OFF	OFF	895~ 955

To keep good printing quality, proper switch (DS3) setting have to be done.

Note: Thermal head rank or resistance is indicated on each thermal head.

2) NEC type

THERMAL HEAD RANK/DS3 SETTING TABLE

Rank No.	SW. 3	SW. 2	SW. 1	Thermal head resistance (ohms)
1	ON	ON	ON	1288~1246
2	ON	ON	OFF	1245~1204
3	ON	OFF	ON	1203~1162
4	ON	OFF	OFF	1161~1120
5	OFF	ON	ON	1119~1078
6	OFF	ON	OFF	1077~1036
7	OFF	OFF	ON	1035~ 994
8	OFF	OFF	OFF	993~ 952

3) TEST MODES PROCEDURES

This test modes functions are usually used at factory for test purposes.
There are existing two kind of test modes.

A) Fax test mode.
B) Dial test mode (German version only).

A) Fax test mode procedure

1. Set Test 1 and Test 2 bits (see switch description on page 14.) as below.

(TYPE-A)

DS2	SETTING
TEST 1 (SW. No. 6)	ON
TEST 2 (SW. No. 7)	OFF

*Modem: Matsushita

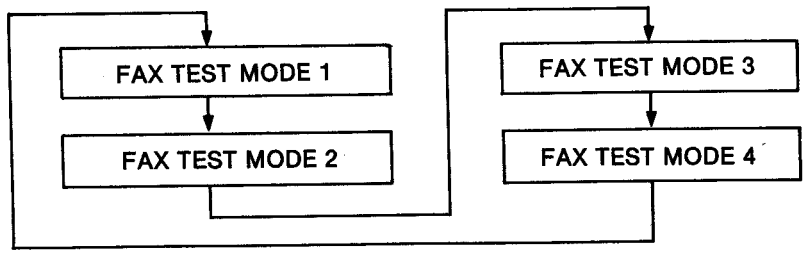
(TYPE-B)

DS1	SETTING
TEST 1 (SW. No. 3)	ON
TEST 2 (SW. No. 4)	OFF

*Modem: Rockwell

2. Then, turn the power on.
   Now, Fax test mode 1 is set when the power is turned on.

3. To select the Fax test mode 1 to 4.
   Depress the Mode button to change Fax test modes.



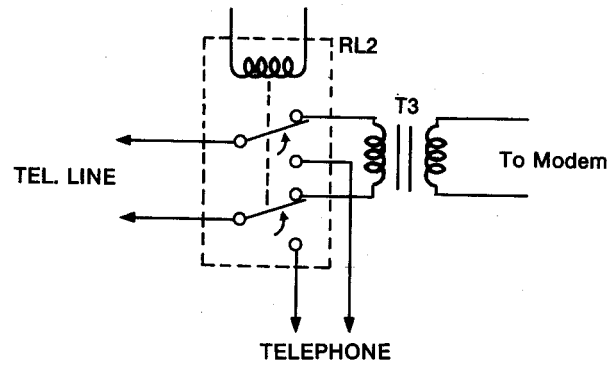
4. Description of Fax Test Modes.

FAX TEST MODE 1

This mode 1 is used for life ageing test purpose. Apparatus will start copying function continueously with 1cm/1hour. Apparatus will stop copying when the recording paper is run out or depress the MODE button.

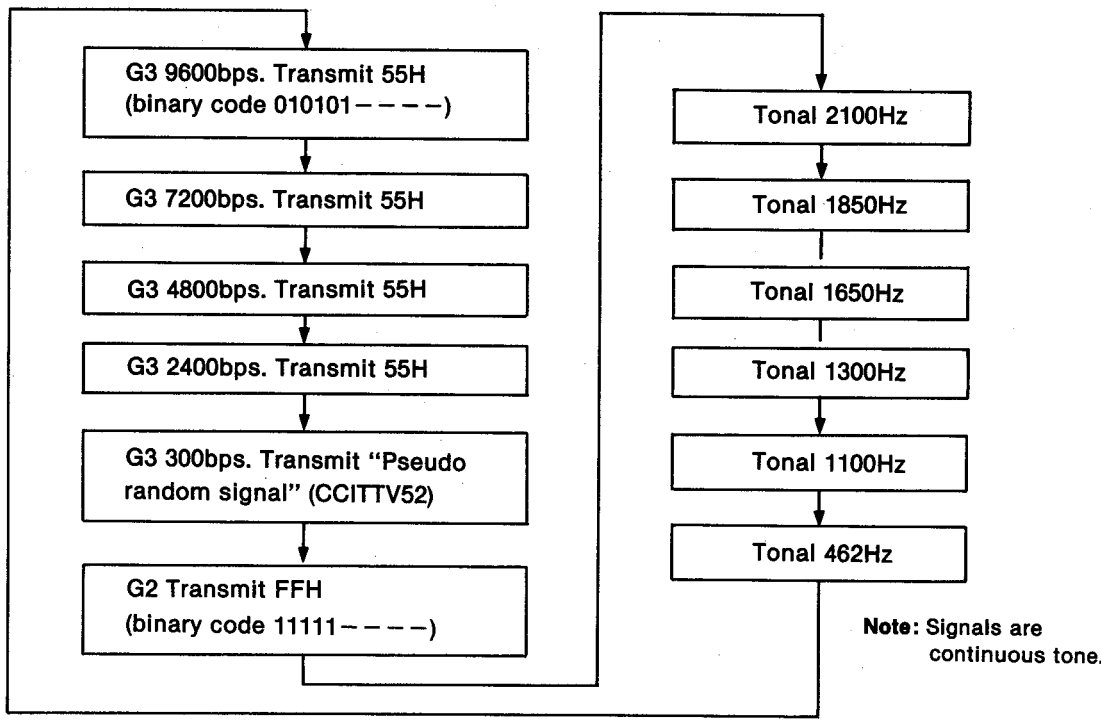
FAX TEST MODE 2

The relay (RL2) on N.C.U circuit will be switched over to facsimle side (Modem side) from telephone side.



FAX TEST MODE 3

Tel-line will be connected to facsimile side (RL2) and signals described as below are transmitted to the Tel-line. Depress the START button to change the signal.



Note: Signals are continuous tone.

FAX TEST MODE 4

This mode 4 is identical with mode 3 except transmitting signals (each signal will be transmitted for 3 sec periods) are changed automatically without depressing START button.

B) Dial test mode procedure (German version of PFX 6800 only)

1. Set Tset 1 and Test 2 bits (See switch description on page 14.) as below.

(TYPE-A)

DS2	Setting
Test 1 (SW. No. 6)	ON
Test 2 (SW. No. 7)	OFF

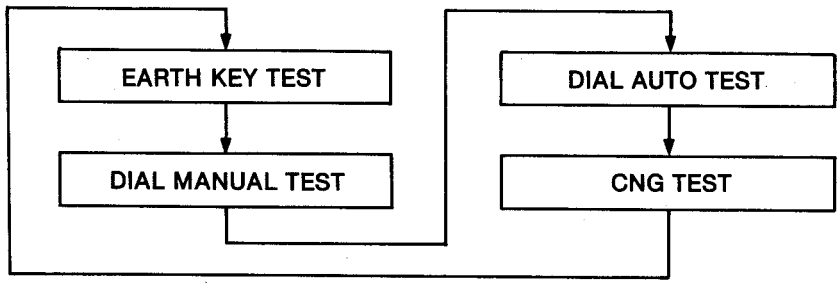
*Modem: Matsushita

(TYPE-B)

DS1	Setting
Test 1 (SW. No. 3)	ON
Test 2 (SW. No. 4)	OFF

*Modem: Rockwell

2. Then, turn the power on with the MODE button is depressed. Now, Dial test mode is set and select the dial test mode by depressing the MODE button.



3. Description of Dial test modes.

EARTH KEY TEST

EARTH KEY function will be activated for 300 msec when depress [#] button.

DIAL MANUAL TEST

Dialing signal will be transmitted to the telephone line when depress dialing buttons ([1]~[0], [*], [#], [PAUSE]).
Note: [*], [#] keys do not function in pulse dial mode.

DIAL AUTO TEST

Dialing signals (pulse or tone) will be transmitted automatically to the telephone line in numeral order as shown in below.

[1] [2] [3] [4] [5] [6] [7] [8] [9] [*] [0] [#] [PAUSE] [1]----------

output in order without depressing keys.
Note: [*], [#] Keys do not function in pulse dial mode.

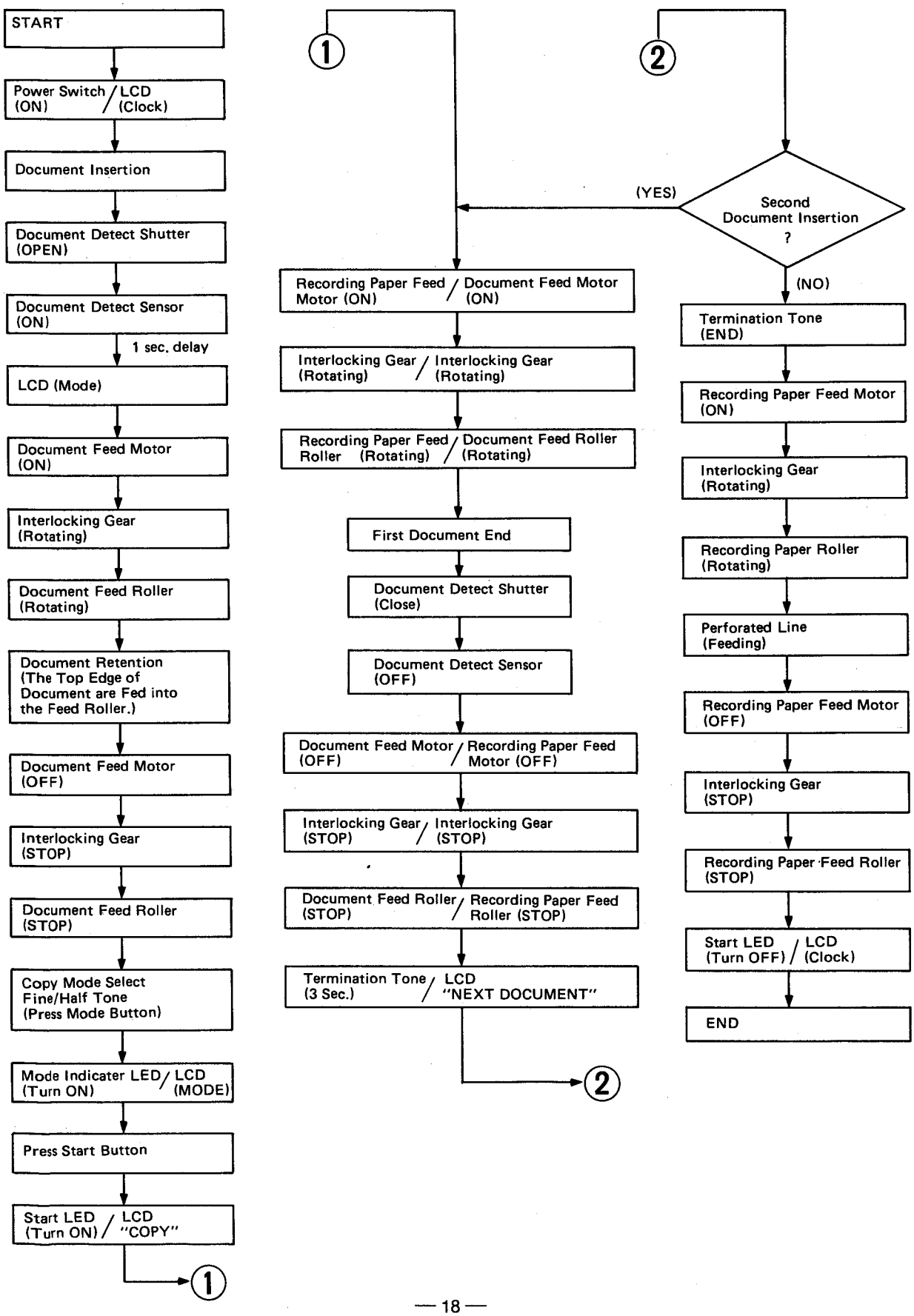
CNG TEST

CNG (1100Hz) tone will be transmitted continuously to the telephone line.

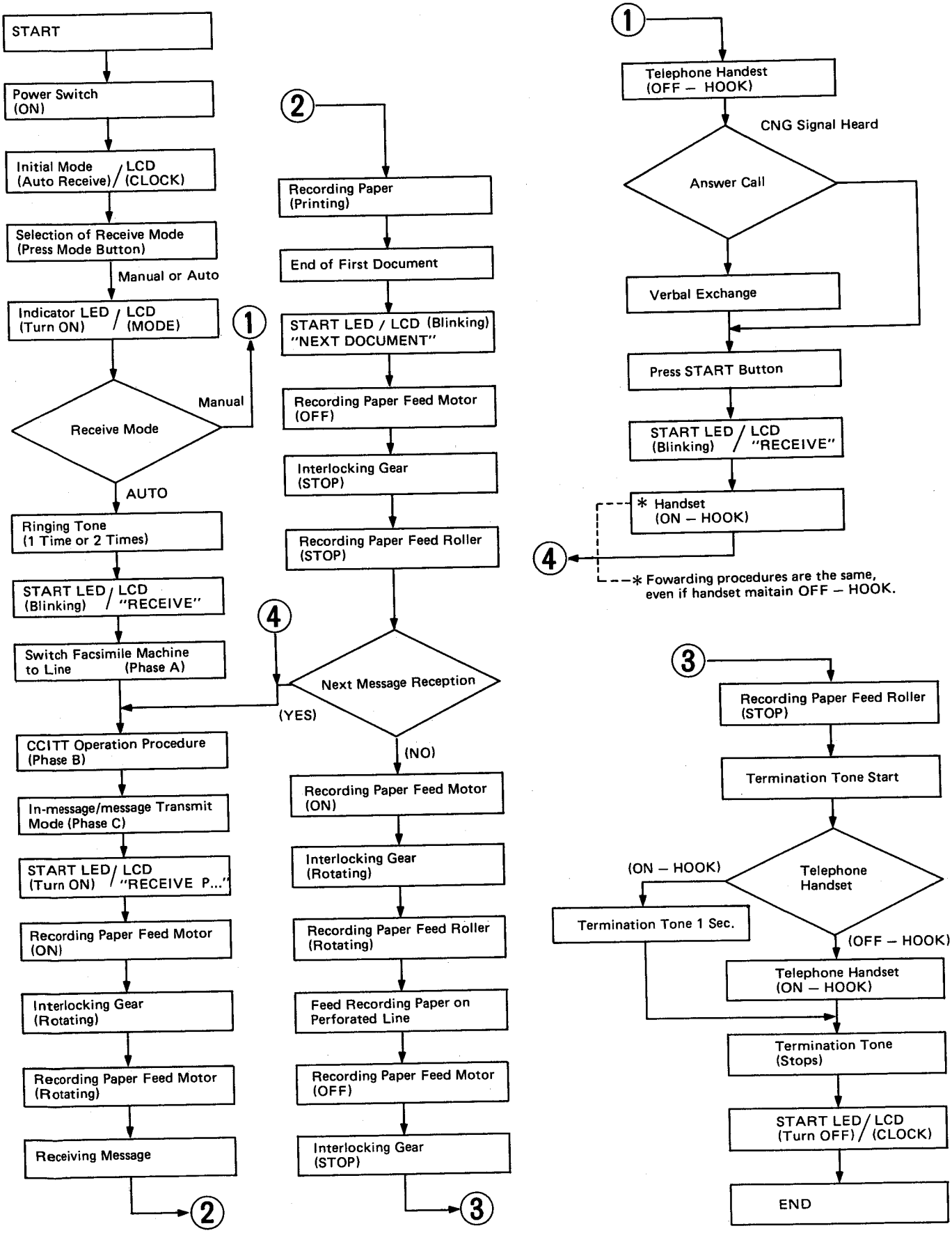
7. FLOW DIAGRAMS

1) OPERATION FLOW DIAGRAMS

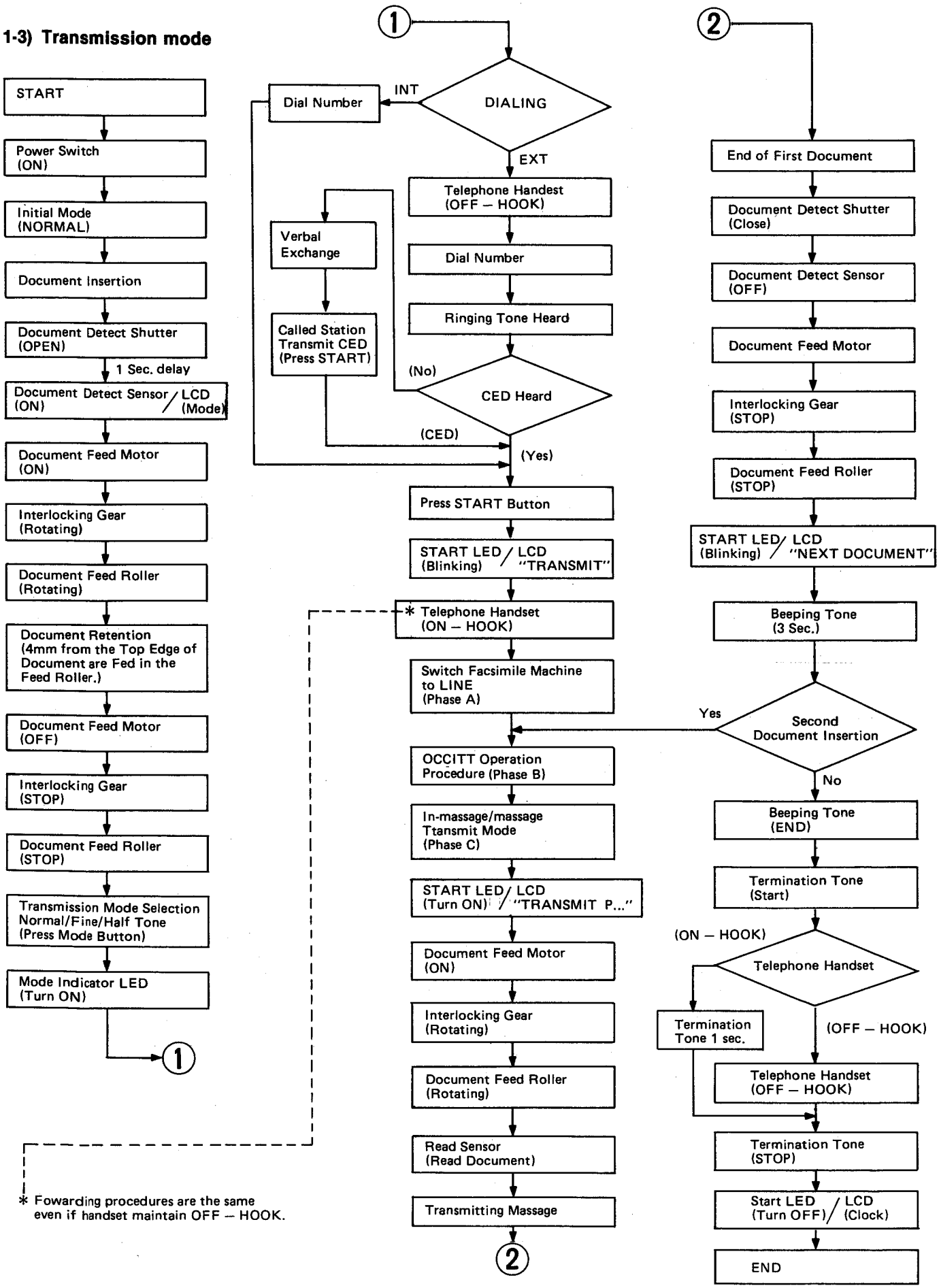
1-1) Copying mode



1-2) Reception mode

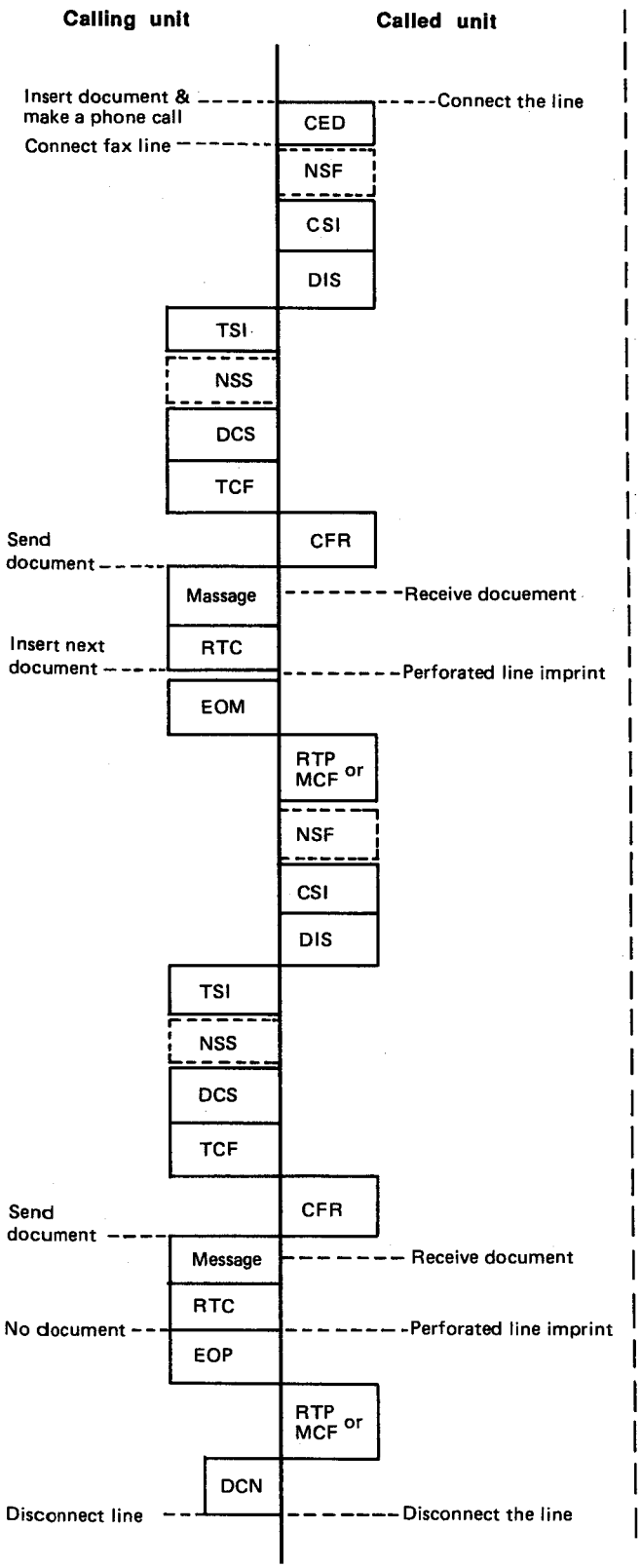


1-3) Transmission mode

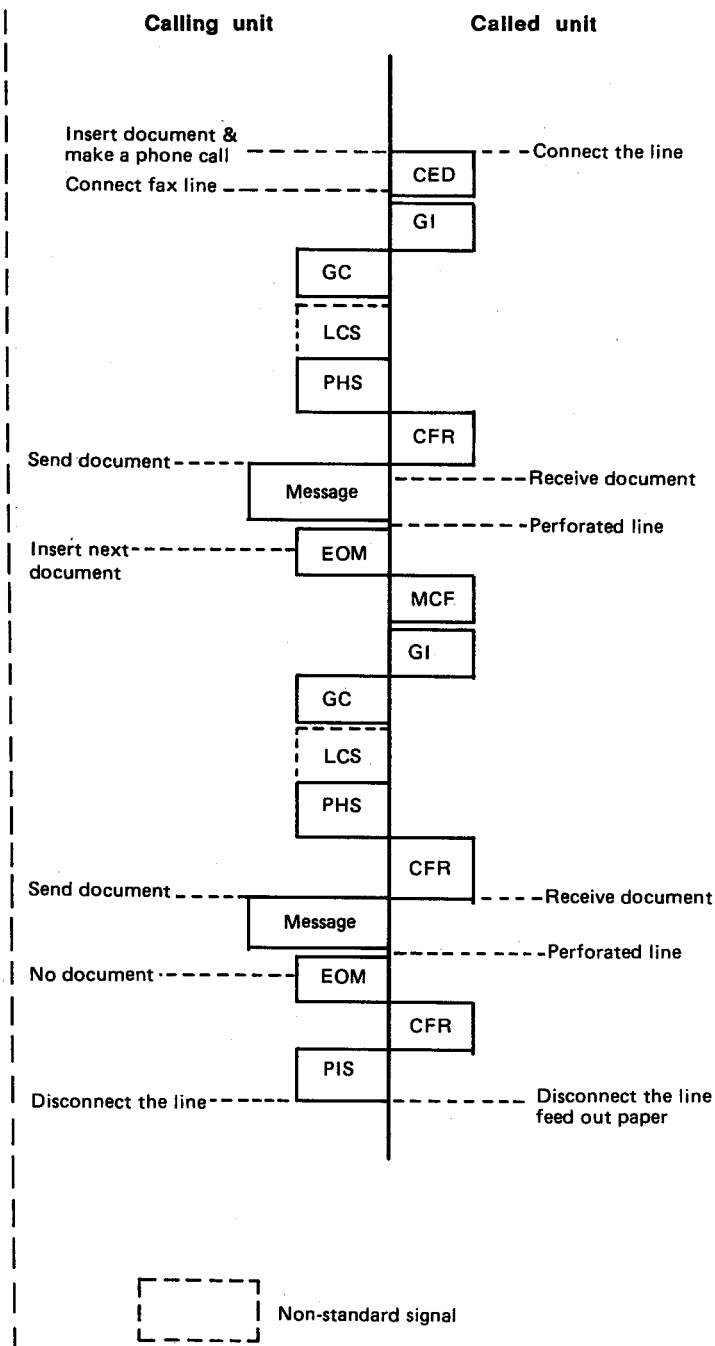


2) CCITT group 2/group 3 protocol

Group 3 protocol procedure



Group 2 protocol procedure



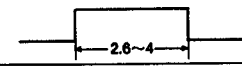
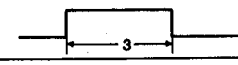
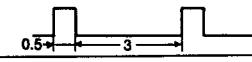
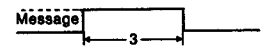
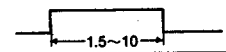
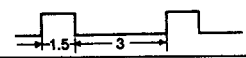
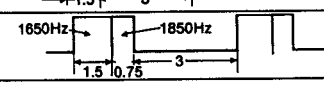
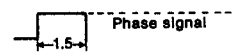
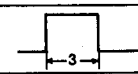
Non-standard signal

3) INDEX OF ABBREVIATIONS

3-1) Index of abbreviations used in Group 3 (CCITT)

Abbreviation	Function	Signal format
CED	Called station identification	2100Hz
CFR	Confirmation to receive	X010 0001 1850 or 1650Hz for 3 s
CRP	Command repeat	X101 1000
CIG	Calling subscriber identification	1000 0010
CNG	Calling tone	1100 Hz for 500 ms
CSI	Called subscriber identification	0000 0010
DCN	Disconnect	X101 1111
DCS	Digital command signal	X100 0001
DIS	Digital identification signal	0000 0001
DTC	Digital transmit command	1000 0001
EOM	End of message	X111 0001 1100Hz
EOP	End of procedure	X111 0100
FCF	Facsimile control field	—
FIF	Facsimile information field	—
FTT	Failure to train	X010 0010
GC	Group command	1300Hz for 1.5−10.0s 2100Hz for 1.5−10.0s
GI	Group identification	1650 or 1850Hz
HDLC	High-level data link control	—
LCS	Line conditioning signals	1100Hz
MCF	Message confirmation	X011 0001 1650 or 1850 Hz
MPS	Multi-page signal	X111 0010
NSC	Non-standard facilities command	1000 0100
NSF	Non-standard facilities	0000 0100
NSS	Non-standard set-up	X100 0100
PIN	Procedural interrupt negative	X011 0100
PIP	Procedural interrupt positive	X011 0101
PIS	Procedure interrupt signal	462Hz for 3s
PRI-EOM	Procedure interrupt-EOM	X111 1001
PRI-EOP	Procedure interrupt-EOP	X111 1100
PRI-MPS	Procedure interrupt-MPS	X111 1010
RTN	Retrain negative	X011 0010
RTP	Retrain positive	X011 0011
TCF	Training check	Zeros for 1.5s
TSI	Transmitting subscriber identification	X100 0010

3-2) Index of abbreviations used in Group 2 (CCITT)

Abbreviation	Function	Freq. (Hz)	Timing (sec.)
CED	Called station identification	2100Hz±15	
CFR2	Confirmation to receive group 2	1650Hz±6	
CNG	Calling tone	1100Hz±38	
EOM	End of message	1100Hz±38	
GC2	Group 2 command	2100Hz±10	
GI2	Group 2 identification	1850Hz±6	
GI 1/2	Group 1/2 identification	1650Hz 1850Hz ±6	
LCS	Line conditioning signal	1100Hz±50	
MCF 2	Message confirmation group 2	1650Hz±6	Same as CFR2
PIS	Procedure interrupt signal	462Hz±1.5	

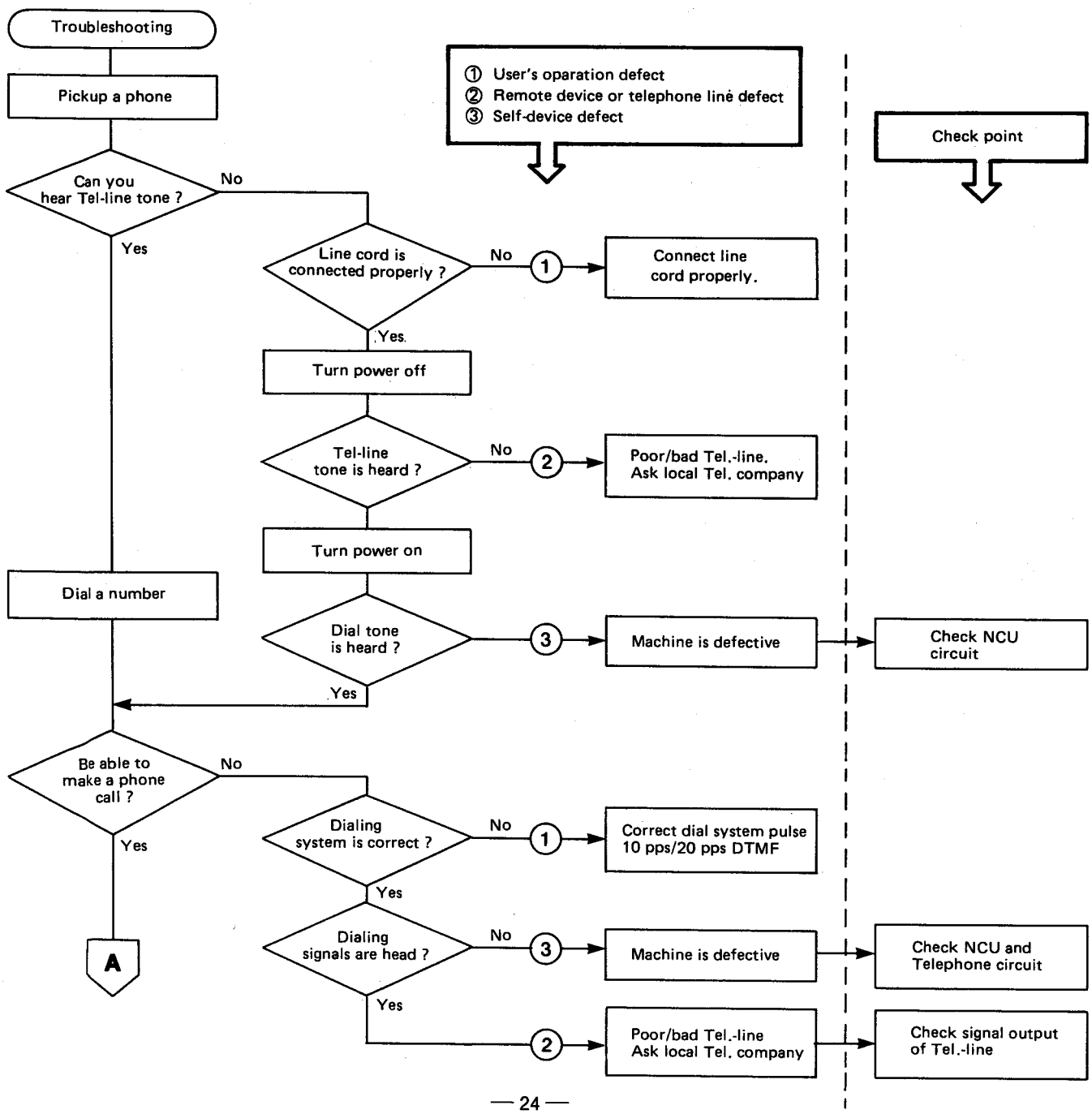
8. TROUBLESHOOTING INSTRUCTIONS

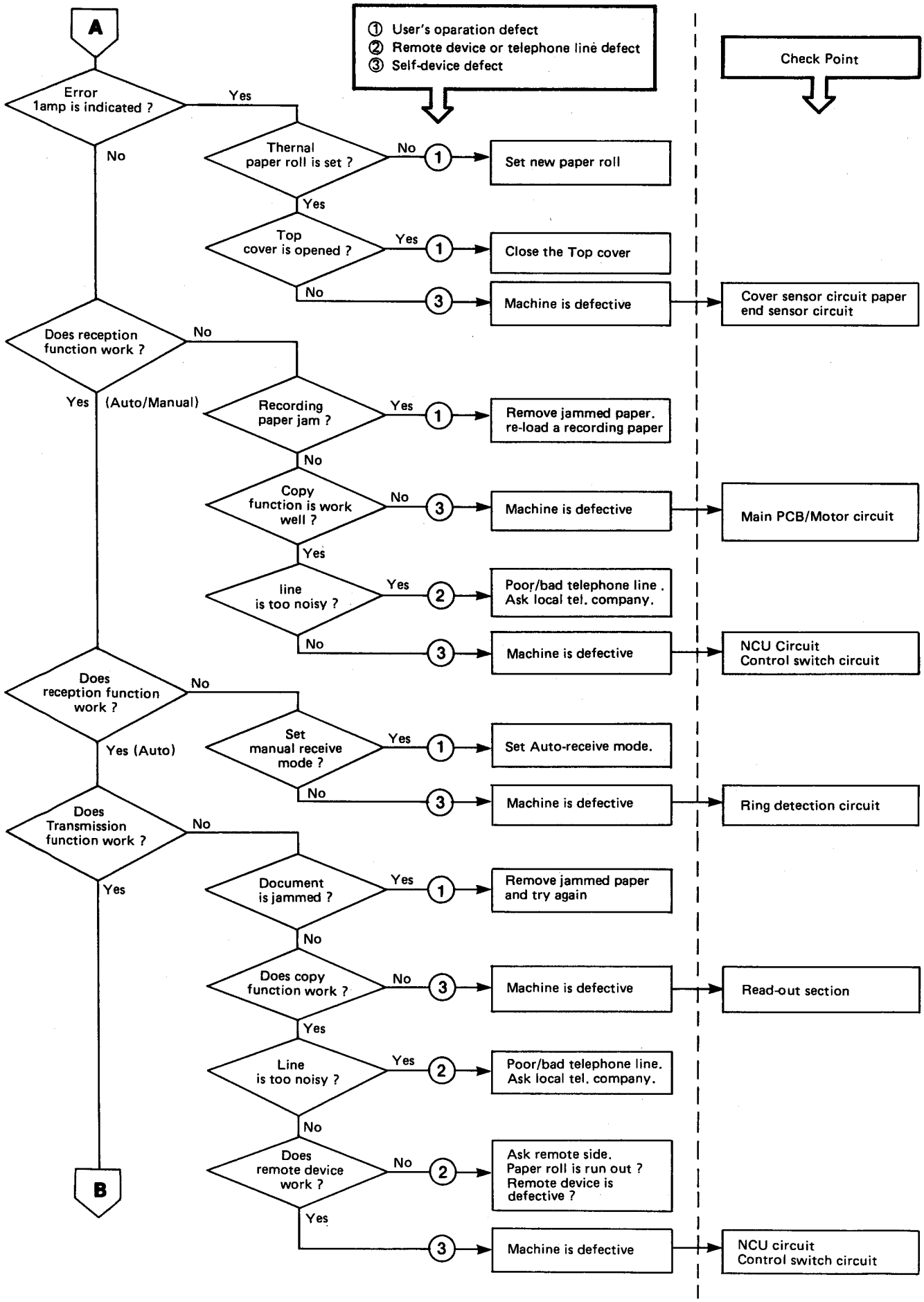
In order to repidly diagnose the cause of a problem encountered during use of the unit, the cause should first be classified as one of the following three.

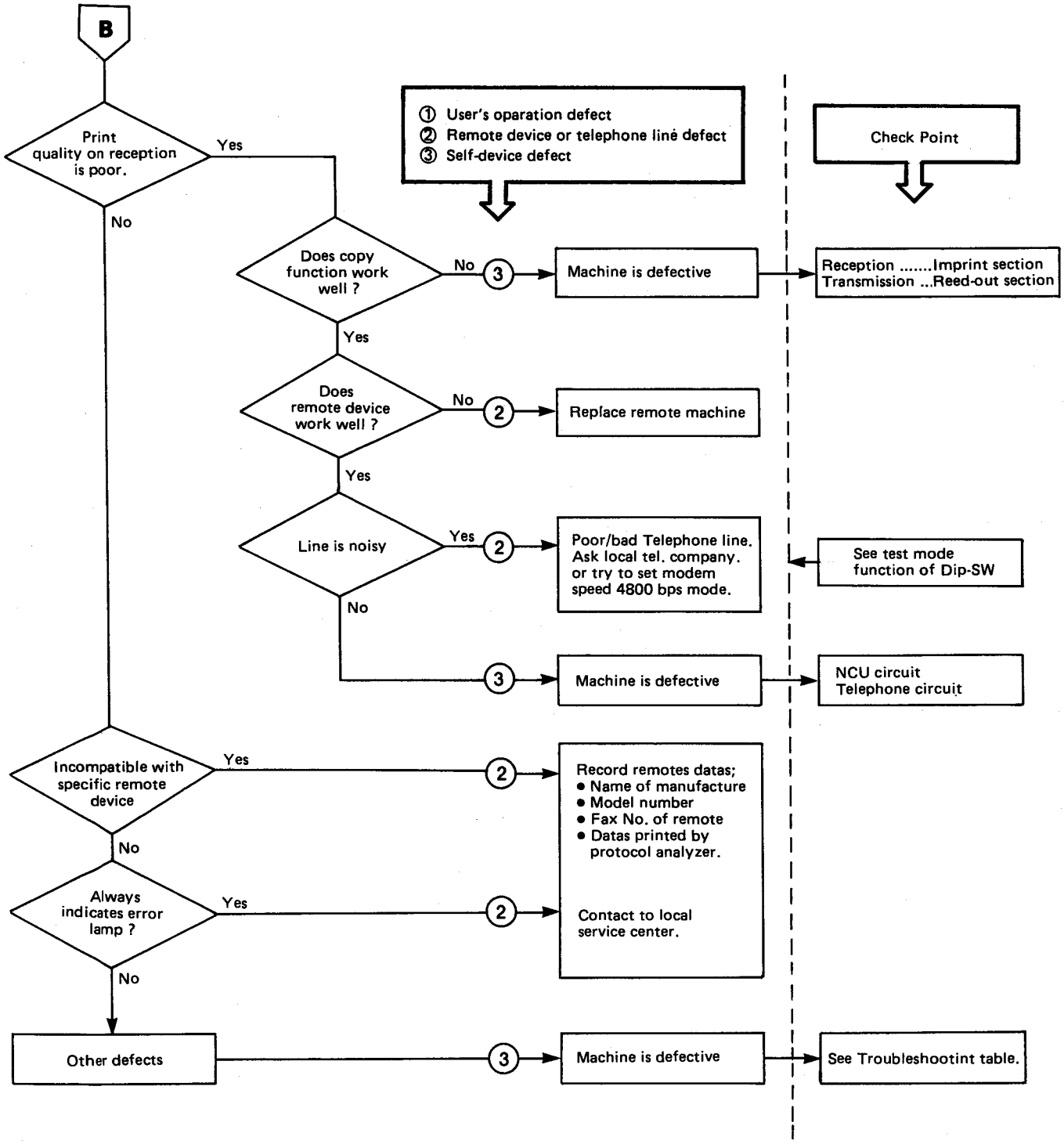
(1) A malfunction resulting from the way the user has used the unit.
(2) A malfunction resulting from a problem of the other unit or of the telephone circuit.
(3) A malfunction resulting from a problem of this unit.

Refer to the "TROUBLESHOOTING FLOW DIAGRAM" (in a subsequent section) to classify problems into one of the three classifications described above.
If the problem is diagnosed as a malfunction resulting from a problem of this unit, refer to the "Troubleshooting Table". For models with the liquid-crystal display, check the error code displayed on the liquid-crystal display, and then refer to the "Error Code Table".

1) TROUBLESHOOTING FLOW DIAGRAM




A
① User's oparation defect
② Remote device or telephone line defect
③ Self-device defect
Check Point
Error 1amp is indicated ?
Yes
No
Thernal paper roll is set ?
No
1
Set new paper roll
Yes
Top cover is opened ?
Yes
1
Close the Top cover
No
3
Machine is defective
Cover sensor circuit paper end sensor circuit
Does reception function work ?
No
Yes (Auto/Manual)
Recording paper jam ?
Yes
1
Remove jammed paper. re-load a recording paper
No
Copy function is work well ?
No
3
Machine is defective
Main PCB/Motor circuit
Yes
line is too noisy ?
Yes
2
Poor/bad telephone line . Ask local tel. company.
No
3
Machine is defective
NCU Circuit Control switch circuit
Does reception function work ?
No
Yes (Auto)
Set manual receive mode ?
Yes
1
Set Auto-receive mode.
No
3
Machine is defective
Ring detection circuit
Does Transmission function work ?
No
Yes
Document is jammed ?
Yes
1
Remove jammed paper and try again
No
Does copy function work ?
No
3
Machine is defective
Read-out section
Yes
Line is too noisy ?
Yes
2
Poor/bad telephone line. Ask local tel. company.
No
Does remote device work ?
No
2
Ask remote side. Paper roll is run out ? Remote device is defective ?
Yes
3
Machine is defective
NCU circuit Control switch circuit
B


B
Print quality on reception is poor.
Yes
No
① User's oparation defect
② Remote device or telephone line defect
③ Self-device defect
Check Point
Does copy function work well ?
No
3
Machine is defective
Reception .....Imprint section
Transmission ...Reed-out section
Yes
Does remote device work well ?
No
2
Replace remote machine
Yes
Line is noisy
Yes
2
Poor/bad Telephone line. Ask local tel. company. or try to set modem speed 4800 bps mode.
See test mode function of Dip-SW
No
3
Machine is defective
NCU circuit
Telephone circuit
Incompatible with specific remote device
Yes
2
Record remotes datas;
• Name of manufacture
• Model number
• Fax No. of remote
• Datas printed by protocol analyzer.
No
Always indicates error lamp ?
Yes
2
Contact to local service center.
No
Other defects
3
Machine is defective
See Troubleshootint table.

2) TROUBLESHOOTING TABLE

	Description of defect	Probable cause	Suggested remedy
1	No power	1) Defective power supply unit.	Replace a power supply unit.
		2) Disconnection of primary and secondary connectors.	Connect the connector properly.
		3) Thermal protection circuit is activated (TH terminal). Temperature reaches over 80° C.	Check thermal protection circuit.
2	Malfunction when power is turned on. (LCD or LED indications are abnormal.)	1) Defective Main PCB and malfunction of MPU.	Replace Main PCB.
		2) Low power dc voltage due to defective power supply unit.	Check dc voltages on power supply. Replace a power supply unit.
3	Disconnection of line on transmission mode.	1) Improper transmit level	Check transmit level, and set the transmit level properly by using dip-sw on bottom of unit.
		2) Incompatibility/communication error	Contact with service center, inform datas; 1) Indicated error code: 2) Datas printed by protocol analyzer. 3) Model No. of remote machine. 4) Description of fault.
4	Print quality is poor on reception mode or transmission mode.	1) Telephone line is noisy.	Chech with local telephone company.
		2) Machine connection location is too far distance from local telephone switching device.	Set pre-emphasis switch properly.
5	Dialing operation does not function properly	1) Dialing system is set improperly.	Set proper dialing system. pulse dial 10pps or 20pps. Tone dial (DTMF)
		2) Dial circut is defective.	Replace a dial circuit.
6	Document is not taken in when placed for transmission.	1) Document sensor circuit is defective (sensor PCB, shutter lever of sensor etc).	Replace sensor PCB or defective components.
		2) Drive mechanism is defective. Such as motor, driving gears.	Replace defective components.
		3) Malfunction of the main PCB. (Motor drive circuit, Motor interface circuit etc.).	Replace the main PCB.
7	During the transmission, reception or copying operating, driving mechanism is noisy or emitting strange sound.	1) Motor (M1/M2) is defective.	Replace the motor.
		2) Gears are damaged on roller and motor ass'y.	Replace the roller ass'y motor ass'y.
		3) Main PCB ass'y is defective.	Replace the Main PCB ass'y.
		4) Wires ass'y with connector of the motor are defective.	Replace wires ass'y with connector of the motor.
8	Tel-line will not switch over to Fax on reception or transmission mode.	1) NCU circuit is defective. Such as loop current detection, relay, relay driver circuits.	Replace defective portion.
		2) Main PCB ass'y is defective. Such as interface circuits for loop current detection, relay and START switch.	Replace defective portion or main PCB.
		3) Start switch is defective.	Replace start switch PCB.
9	Transmission operation does not function when, in the transmission mode, telephone line switched over to Fax.	1) Modem unit is defective.	Replace the Modem unit.
		2) NCU circuit is defective. Wires ass'y, audio trans and amplifier etc.	Replace defective portion.
		3) Main PCB ass'y is defective. Modem interface, image datas processor portion etc.	Replace the main PCB ass'y.
		4) Image sensor unit is defective.	Replace the image sensor unit.

	Description of defect	Probable cause	Suggested remedy
10	Image datas errors on transmission mode. (in case of machine problem, not caused by line condition).	1) Modem unit is defective.	Replace the modem unit.
		2) NCU circuit is defective. Such as telephone line circuit and amplifier circuitry for transmission.	Replace the defective portion.
11	Paper end indication is always functioned.	1) Paper end sensor circuit is defective.	Re-align the paper end sensor ciruct or replace paper end sensor circuit.
		2) Main PCB ass'y is defective. Interface circuit for paper and sensor.	Repair or replace the main PCB ass'y.
12	Auto-receive function does not work.	1) NCU circuit is defective. Ringer detection circuit.	Replace defective portion.
		2) Main PCB ass'y is defective. Interface circuit for ringer detection.	Repair or replace the main PCB ass'y.
13	Reception operation does not function when, in the reception mode, telephone line switched over to Fax.	1) Modem unit is defective.	Replace the modem unit.
		2) NCU circuit is defective. Such as telephone line, audio trans, amplifier for transmission and reception.	Replace the defective portion.
		3) Main PCB ass'y is defective. Interface circuit for modem.	Replace the main PCB ass'y.
14	Print quality is poor on reception mode. (Cause is not related to telephone line condition)	1) Modem unit is defective.	Replace the Modem unit.
		2) NCU section is defective. Mainly amplifier circuitry for reception.	Repalce defective portion.
15	Copy impressions are flawed, unclear vertical lines (white or black) appear on local copy mode on reception mode.	1) Thermol head tip dirty or otherwise contaminated.	Clean the thermal print head (See "cleaning" on page 4).
		2) Thermal head is defective . Impression element is dead.	Replace the thermal head.
		3) The wires connection for thermal head is defective.	Repair for wire connection.
		4) Main PCB is defective. Mainly strobe signal oscillator, interface circuit control IC for thermal head.	Replace the Main PCB.
		5) Image sensor block is defective.	Replace the image sensor unit.
16	During copying of data being received, horizontal lines appear and/or the impressions are deviated or irregular.	1) Driving mechanism is defective such as gear, roller and motor.	Replace defective portion.
		2) Main PCB ass'y is defective. Portions such as motor drive IC (IC3, IC4).	Replace the main PCB ass'y.
		3) Modem unit is defective.	Replace the modem unit.
17	Printed out letters is fading.	1) Are the setting of the dip-switch (DS3) correct?	See instruction of "Thermal head rank/DS3 setting table".
		2) Improper thermal paper is used.	Replace the thermal paper roll and use proper paper roll.
		3) Power supply voltages of thermal head is too low (+24V).	Repalce the power supply unit.

3) TROUBLE OF ERROR CODE

3-1) OPERATION ERROR

CODE NO.	LCD INDICATION	DESCRIPTION
01	"OVER HEAT"	Temperature of power unit rises to 80° C (Approx.).
02	"HEAT TEMP. ERROR"	Temperature of thermal head rises to 70° C (Approx.).
03	"COVER OPEN"	Upper Cabinet is opened.
04	"DOCUMENT JAM"	During Transmission or copying mode, machine was interrupted du to limit 600mm length or Document Jamming.
05	"PAPER END"	No paper roll or paper end mark are appeared on copy, Transmission or stand-by mode.

* If code "01", "02" is appeared, auto-thermal protection will be functioned. Wait far a while with power switch off.

3-2) COMMUNICATION ERROR

CODE NO.	DESCRIPTION
10	Not used.
11	Not used.
12	Not used.
13	When transmit, receiving the Ending command from remote unit.
14	Disconnected during communication
15	Same as code 13.
16	Same as code 14.
17	After reception of DIS, Line was accidentally disconnected before sending DCS.
18	Line was accidentally disconnected during transmission of DCS.
19	Line was accidentally disconnected after transmission of DCS.
1A	Line was accidentally disconnected during sending training signal behind DCS.
1B	Coming DCN when waiting CFR or FTT after transmission of DCS + Training.
1C	Line was accidentally disconnected during reception CFR.
1D	Not used.
1E	Line was accidentally disconnected during transmission of Image data.
1F	Line was accidentally disconnected after transmission of Image data.
20	↑ Same as 1F code.
21	NOT USED.
22	↑ Same as 1F code.
23	Accidentally disconnected before transmission of EOP.
24	Accidentally disconnected during transmission of EOP.
25	Accidentally disconnected after transmission of Image data before transmission of PRI-EOM.
26	Accidentally disconnected during transmission of PRI-EOM.
27	Accidentally disconnected transmission of MPS.
28	Print quality is defective. (RTN)
29	Coming ending command from remote unit when sending post message after Image data.
2A	Print quality is defective. (PIN)
2B	CRP is transmitted from remote unit more than 3 times.
2C	Sending Post message command, but returned improper command from remote unit.
2D	After manuscript transmission, line was disconnected due to no response against post message command.
2E	Accidentally disconnected during reception confirming signal (MCF, RTP, RTN etc.).
2F	Not used.
30	Cover was opened after transmission of Image data and Line was disconnected before transmission of DCN.
31	Same as error code 29.
32	Coming DCN from remote unit after talk requested.
33	CKP is transmitted from remote unit more than 3 times after talk requested.
34	Same as 2C.
35	Same as 2D.
36	Accidentally disconnected after talk reqested.
37	Accidentally disconnected after talk requested from remote unit.
38	Accidentally disconnected before the interrupt command (PRI-EOM etc.) for the talk request from remote unit.
39	Accidentally disconnected during setting transmit mode on transmission mode.
3A	Line was accidentally disconnected right after reception.
3B	Line was accidentally disconnected right after CED transmitted.
3C	Accidentally disconnected during or before transmission of CSI, DIS.
3D	During waiting for next document, does not be transmitted next document from remote unit.
3E	Disconnected when no response from remote unit in spite of sending DIS, T1 time elapsed on reception mode.
3F	Sending DIS, but receives DIS (improper command) from remote unit.
40	Sending DIS, but receives CRF (improper command) from remote unit.
41	Sending DIS, but receives FTT (improper command) from remote unit.
42	Sending DIS, but receives EOM (improper command) from remote unit.
43	Sending DIS, but receives MPS (improper command) from remote unit.
44	Sending DIS, but receives EOP (improper command) from remote unit.
45	Sending DIS, but receives PRI-EOM (improper command) from remote unit.
46	Sending DIS, but receives PRI-MPS (improper command) from remote unit.
47	Sending DIS, but receives PRI-EOP (improper command) from remote unit.
48	Sending DIS, but receives MCF (improper command) from remote unit.
49	Sending DIS, but receives RTP (improper command) from remote unit.
4A	Sending DIS, but receives RTN (improper command) from remote unit.
4B	Sending DIS, but receives PIP (improper command) from remote unit.
4C	Sending DIS, but receives PIN (improper command) from remote unit.
4D	Telephone line was accidentally disconnected during reception of DCS or GC.
4E	Telephone line was accidentally disconnected during transmission of GI.
4F	Telephone line was accidentally disconnected after recognition for compatibility of both parties.
50	Telephone line was accidentally disconnected after checking of TCF.

CODE NO.	DESCRIPTION
51	Telephone line was accidentally disconnected during transmission of FTT or CFR.
52	Receives DCN on biggining of receive mode.
53	Receives improper command after sending CFR or FTT. Then disconnected the line.
54	Does not receive commands or image signal after transmission of CFR or FTT.
55	Telephone line was accidentally disconnected during stand-by of DCS after recognition of TCF signal-NG.
56	Responding to MPS but line is disconnected at remote unit.
57	Same as 8D but PIP signal.
58	Not used.
59	Not used.
5A	Same as 54.
5B	Telephone line was accidentally disconnected during reception of image datas.
5C	Telephone line was accidentally disconnected after reception of MPS.
5D	After reception of image datas, telephone line was accidentally disconnected during transmission of PIP.
5E	After reception of image datas, telephone line was accidentally disconnected during transmission of RTP.
5F	NOT USED.
60	Telephone line was accidentally disconnected after reception of talk request from remote unit.
61	Same as 60.
62	Receives talk request from remote, line was accidentally disconnected during transmission of PIP.
63	Same as 3D.
64	Receives improper command from remote unit.
65	Not used.
66	Not used.
67	Line was accidentally disconnected during transmission of G2 phase signal.
68	Same as 67.
69	On transmitting of G2 mode, remote machine was not ready to receive.
6A	Line was accidentally disconnected during reception of tonal CFR.
6B	After receiving the MCF, not receive GI 2, transmitting the PIS after T1 time elapsed, disconnected the line.
6C	Not used.
6D	Not used.
6E	Line was accidentally disconnected during transmission of image data on G2 mode.
6F	Not used.
70	Same as 6E.
71	Line was accidentally disconnected during transmission of EOM on G2 mode.
72	Receives no response signal after transmission of manuscript on G2 TX-mode.
73	Line was accidentally disconnected during reception of tonal MCF on G2 mode.
74	Sending PIS signal after T2 time elapsed due to receive improper signal or receive none signal after transmission of EOM.
75	Same as 73.

CODE NO.	DESCRIPTION
76	Not used.
77	Line was accidentally disconnected during transmission of PIS.
78	After transmission of tonal GI, line was accidentally disconnected during reception of GC.
79	Line was accidentally disconnected during reception of GC.
7A	Line is disconnected during G2 communication.
7B	Not receive the trainning signal before reception of manuscript on G2-RX mode.
7C	Line was accidentally disconnected during reception of phase signal on G2 mode.
7D	Same as 7A.
7E	Line was accidentally disconnected during transmission of CFR signal on G2 mode.
7F	On reception mode, image picture signal is interrupted or receives the signal other than EOM at end of document data.
80	Receives no command after completion of reception on G2 mode.
81	Line was accidentally disconnected during reception of image datas on G2 mode.
82	Not used.
83	Line was accidentally disconnected during transmission of MCF on G2 mode.
84	Line was accidentally disconnected during reception of GC on G2 mode.
85	STOP KEY is pressed during communication.
86	On reception mode, remote unit is also reception mode.
87	After receiving DIS, sending DCS + TCF 3 times then disconnected the line.
88	Receives DTC (as response) or DIS after transmission of DCS + TCF, then disconnected the line after repeating the DCS + TCF 3 times.
89	Receives improper command after sending DCS + TCF, then disconnected the line.
8A	Exceeding the one sheet transmission time of 8 minutes.
8B	On reception mode, after receiving RTC, or image data is interrupted, not receive the post message command, sending DCN after T2 time elapsed.
8C	On reception mode, line is disconnected due to receive improper command after image datas.
8D	Sending response signal after receiving post message command, then receives improper command and disconnected the line.
8E	Sending response signal (RTP) after receiving post message command, no receive the command within the period of T2 time.
8F	Not used.
90	Receives no response command within the T1 time on transmission mode.
91	Receives improper response command (other than CFR) after sending the phase signal on transmission mode.
92	Polling function is not available against requested by remote unit.
93	Transmitting in Fine or Half tone mode, could not send due to the remote unit is G2 machine. Line is disconnected after T1 time elapsed.
94	Line is busy when Auto dialing call.
95	Line is disconnected during Auto dialing process.

9. TRANSMISSION TERMINAL ID REGISTRATION

POSTAL REGULATION FOR WEST GERMANY

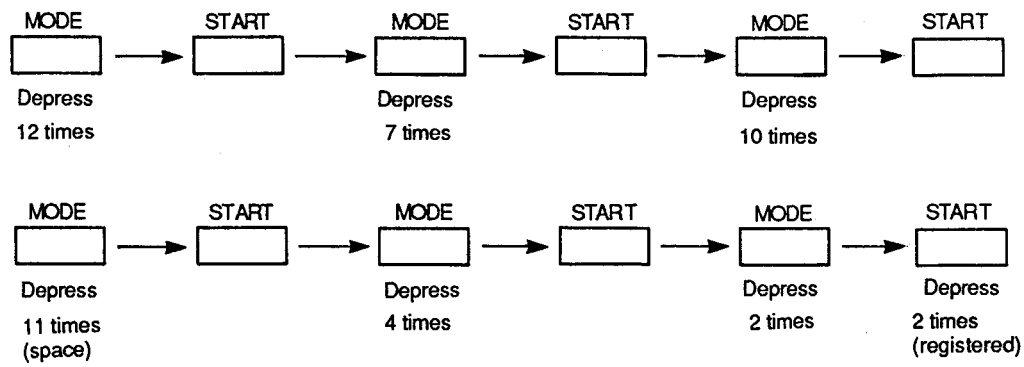
The input of ID (Sender's phone number) must be performed by installing technician. If the machine (after moving etc.) is connected to a different line, contact the authorised service to carry out the change of the number.

ID REGISTRATION PROCEDURE (PFX5800 EUROPEAN VERSION ONLY)

A. To register the ID

1. Turn on the Back up Batt. Switch (See page 14) on the bottom of the unit.
2. Set Test 1 and Test 2 (See page 14) switches to ON position.
3. Turn power ON with the MODE button is depressed.
4. Register the phone number as the ID (20 digits max.) by depressing the MODE button and START button as figured.

Example: +70 42



ID number will be printed out on the recording paper after registered the ID.

5. Turn the power OFF.
6. Test 1 and Test 2 Switches to OFF position
7. Turn the power ON again to return to the ready state.

B. To print out the ID registered

1. Test 1 and Test 2 switches to ON position.
2. Turn power ON with the TALK button is depressed.
3. The registered ID will be printed out.
4. Proceed step 5 to 7 of item A.